

THE Soybean Digest



Official Publication

OF

THE AMERICAN SOYBEAN ASSOCIATION

VOLUME 5 • NUMBER 3



JANUARY • 1945

No More Priorities

ON ST. REGIS VALVE-BAG PACKING MACHINES

They offer maximum industrial packing efficiency and economy



Here's great news to start off 1945!

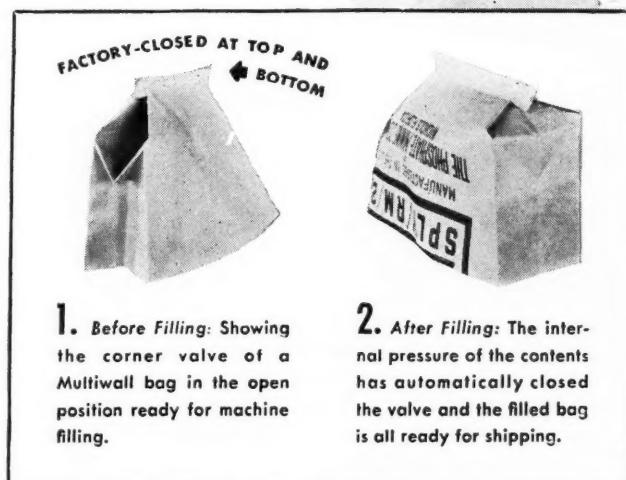
The government has consistently recognized the efficiency and economy of the St. Regis Valve-bag Packing System. And now, all priority controls have been removed from St. Regis bag-filling equipment.

These machines, plus St. Regis Valve Bags comprise a packaging system which reduces packaging costs while providing greater product protection. Here's why:

The St. Regis Valve Bag is made of tough kraft paper ... 2 to 6 plies in thickness. It is securely factory-fastened at both top and bottom and has a specially designed filling valve in one corner. When the bag is filled, the internal pressure of the contents automatically closes this valve. (See illustrations at right.)

St. Regis Valve-packing Machines accurately pre-weigh the product and pack it into the bags. This modern packaging system is saving time and the cost of extra labor and equipment for many manufacturers.

Our Machine and Engineering Division is ready to extend the use of the St. Regis Valve-pack System in the fields of construction materials, chemicals, agriculture, and food products. Write for full information today.



1. Before Filling: Showing the corner valve of a Multiwall bag in the open position ready for machine filling.

2. After Filling: The internal pressure of the contents has automatically closed the valve and the filled bag is all ready for shipping.



NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
BALTIMORE 2: 2601 O'Sullivan Bldg. SAN FRANCISCO 4: 1 Montgomery St.

IN CANADA
BATES VALVE BAG CO., LTD.
Montreal, Quebec
Vancouver, British Columbia

Boston, Mass. Birmingham, Ala. Dallas, Tex. Denver, Colo.
No. Kansas City, Mo. Los Angeles, Calif. New Orleans, La.
Franklin, Va. Seattle, Wash. Nazareth, Pa. Toledo, Ohio

THE Soybean Digest

GEO. M. STRAYER, Editor

KENT PELLETT, Managing Editor

Publishers' Representatives: Ewing Hutchison Co., Chicago

Vol. 5

JANUARY * 1945

No. 3

Published on the 15th of each month at Hudson, Iowa, by the American Soybean Association. Entered as second class matter November 20, 1940, at the postoffice at Hudson, Iowa, under the Act of March 3, 1879. Forms close on 1st of month. Subscription price to association members, \$1.00 per year; to non-members, \$1.50 per year.

IN THIS ISSUE

	Page
<i>Soybeans in Japan</i>	6
W. J. MORSE	
<i>Inoculation Studies</i>	7
L. W. ERDMAN	
<i>Repaint America with Soybean Oil</i>	8
JOHN J. KESSLER	
<i>Soybeans in Livestock Rations</i>	9
W. E. CARROLL	
<i>Fertilizing Soys in North Carolina</i>	11
W. E. COLWELL	
<i>Soybeans in Illinois</i>	13
W. L. BURLISON	
<i>National Soybean Crop</i>	18
<i>Expand World Trade</i>	19
PORTER M. HEDGE	
<i>Soy Yeast Bread</i>	22
<i>Soy Flour in Logging Camps</i>	23
WALTER GOODWIN	
<i>Observations</i>	24
J. E. JOHNSON	
<i>Grits and Flakes</i>	28
<i>Washington Digest</i>	30
<i>Markets and Government Orders</i>	33

Another New Year It would be pleasant to write a conventional New Year message but hardly appropriate, the world situation being what it is at this time.

The rocket bombs and all the other ghastly instruments of death that man's evil genius has contrived remind us that there can be no true happy New Year while the fate of civilization still hangs by a thread.

We shall win the war, but winning the peace promises to be even more difficult of achievement. A dozen civil wars threaten to break out in the wake of the armies of liberation in Europe. Everywhere colored people are rising saying it is time for the white man to take his heels off their necks. Even in this country some treat

the government as though it, not the Nazis or the Japs, were the real enemy of democracy. Others find in labor or business or the farmer the arch enemy of mankind.

Yet if we have any concern for the future we will settle our little differences and bury our pet-hates. This may happen to be the last chance we will have to make a peace that will stick. Weapons now in existence can rain down destruction if not total annihilation on any part of the earth.

The inventors of the V-2 have compressed the globe into a peanut shell. Hereafter, if life is to be tolerable we can no more avoid having solicitude for the problems of our neighbors on the other side of the globe than we can for our neighbors on the next farm or in the next county. We may not like it but that is the way it is to be.

Fortunately, men and women from every rank of life in the U. S. have risen to meet the challenge of the war. It will be necessary for others to arise prepared to make as great a sacrifice if we are to meet the supreme challenge of the peace.

The poet Whitman wrote:

It is provided in the essence of things that from any fruition of success, no matter what, shall come forth something to make a greater struggle necessary.

It fits like a glove the terrific struggle of our time and the greater struggle for the peace to follow.

Full Speed Ahead in 1945

The big job for at least one more year continues to be allout food production. Whatever tendency there may have been a few months ago to plan to rest easier on the oars is now forgotten with the turn events have taken in Europe. Everybody needs to plan on giving all he has got and then a little in the year ahead.

During the optimistic period last summer some men in War Food Administration began to worry about huge surpluses that might be left on our hands if the war should fold up suddenly and the demand from abroad taper off. Then there was some talk of a cut in crop production goals.

The eventual possibility of surpluses is still with us, of course. But far more impelling now is the danger of getting caught short with a war still on and not enough food or other supplies to carry us through. We just can't afford to let that happen.

As Walter Berger says, "It is far better to take a chance on having too much rather than too little." So WFA is asking that acreage of most crops be held up in 1945.

Soybean goals are set at the same figure as last year. In general, growers will need to grow as many beans as in 1944 if the goals are to be met.

The American Soybean Association

OFFICERS: President, Howard L. Roach, Plainfield, Iowa; Vice President, Walter McLaughlin, Decatur, Ill.; Secretary, J. M. Strayer, Hudson, Iowa; Treasurer, J. B. Edmondson, Clayton, Ind.

DIRECTORS: Ersel Walley, Ft. Wayne, Ind.; John Dries, Saukville, Wis.; Jacob Hartz, Stuttgart, Ark.; David G. Wing, Mechanicsburg, Ohio; Harry A. Plattner, Malta Bend, Mo.; Gilbert Smith, Taylorville, Ill.; John Sand, Marcus, Iowa.

It pays to be a Bemis Customer



The full resources of materials, manufacturing and fine printing of 14 textile bag plants and 6 heavy duty paper bag plants—strategically located from coast to coast—are behind every Bemis contract.



East Pepperell, Mass.

SOYBEAN DIGEST



Perhaps we have the solution
to your problem in

SOLVENT EXTRACTION

Solvent extraction is, in some cases, a simple operation. In others it requires unusual technique and specially designed equipment.

Blaw-Knox research engineers have encountered both; with results that have led to notable developments in new methods and new apparatus. In most instances the experimental work has been done. The facts and figures are available . . . The development from laboratory or pilot plant to full scale production unit requires the know-how of experience in engineering, fabrication, and operation. We invite your inquiry now.

BLAW-KNOX DIVISION
of BLAW-KNOX COMPANY
2030 Farmers Bank Building
PITTSBURGH • PENNSYLVANIA

Soybeans in the LAND OF OUR ENEMIES

• In 1929 and 1930 Dr. W. J. Morse of the U. S. D. A. Bureau of Plant Industry was in the Orient making a study of soybeans and collecting varieties for trial in the U. S. Since world attention is now focused on both the Orient and the soybean, the editors believe the following letter which he wrote to the Association from Japan may be of even greater interest now than when it was written.

Tokyo, Japan, July 20, 1929

American Soybean Association
Guelph, Canada

Dear Members:

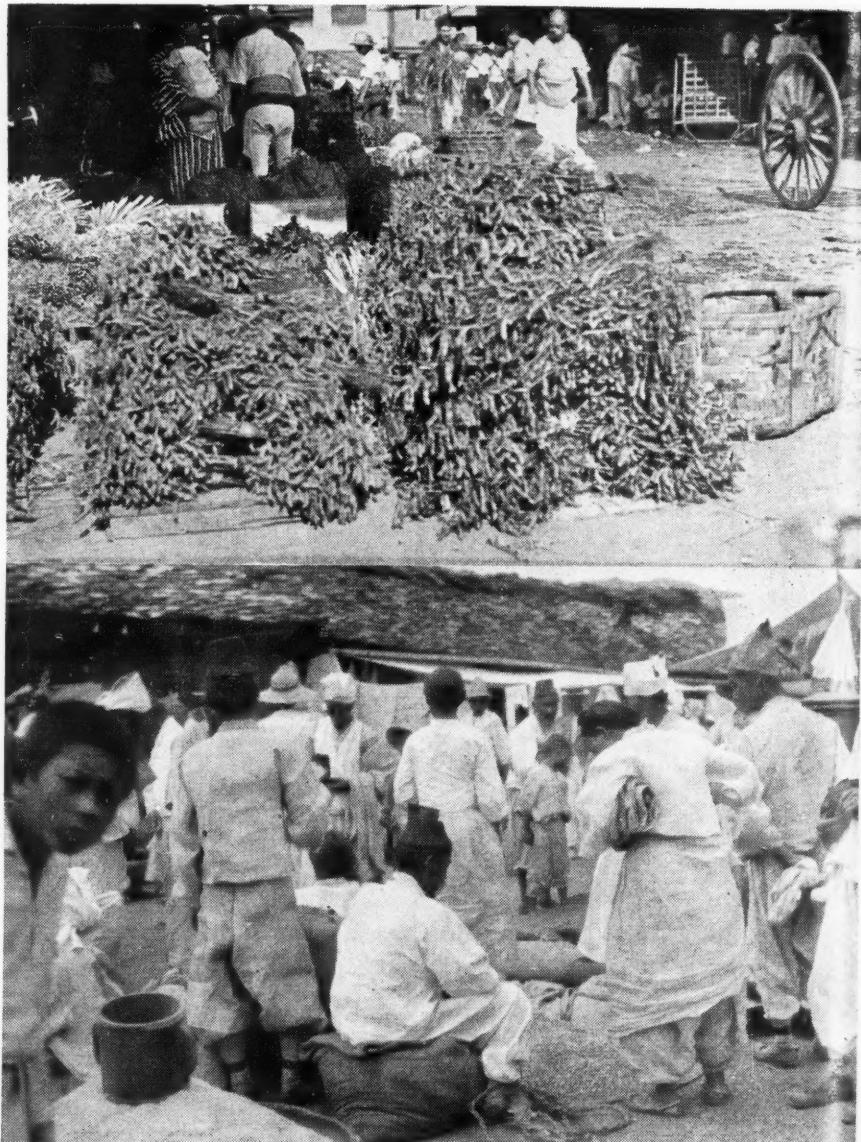
As the time is fast approaching for the 1929 annual meeting of the Association, my mind turns to the many meetings I have enjoyed with you. Since the first annual meeting held at Soylard in 1920 with the Fouts brothers, this meeting is the first I have missed and it is with sincere regret that I am not with you.

Being in the land of the soybean, I thought a few of the many interesting things concerning the crop might be of value to you.

The Oriental Agricultural Exploration Expedition, composed of Mr. P. H. Dorsett, whom many of you had the pleasure of meeting and hearing at the North Caroline meeting, and myself, arrived in Japan March 18 to make investigations regarding the utilization of the soybean in Oriental countries and the securing of varieties that might be of value to widespread American conditions.

The first country to be studied is Japan which has 1,084,823 acres, not including Korea and Formosa, and produces 18,190,765 bushels of seed. The largest soybean section is the island of Hokkaido which has an acreage of 215,212 acres and produces 3,184,245 bushels of beans.

On our arrival and after establishing headquarters in Tokyo, we first began to look up varieties which we might send back to the United States for the 1929 planting. We succeeded in picking up about 100 lots which are now growing in the variety plots at Arlington Farm. In hunting out this seed, we were very much surprised to find the soybeans listed with the garden beans and as garden beans. For the most part these are grown as green vegetable beans. These sorts are black, brown, greenish yellow, and yellow seeded varieties of early, medium and late types.



Top, green vegetable soybeans in Tokyo market. Bottom, farmers' market day in Korean village showing grain section. Such gatherings were rich sources for collecting varieties of soybeans.

Some of the yellow seeded varieties were listed as most suitable for bean curd, soy sauce, miso, natto, and confectionery purposes, such as sweet bean paste, candied beans, roasted beans (like our peanuts), and sugared beans.

It is amazing, the extent to which the soybean is used for food in Japan. Whether or not it can be used in the United States in all of the ways used here is extremely doubtful, that is for human food. Of course, production of oil and oil meal is another question, and this no doubt will be the great factor in the soybean industry in the United States.

It may interest you to know that the beans produced in Japan are used entirely for human food, green manure, and planting purposes. The grain varieties have seed of higher quality than those produced in Manchuria and are not used for oil and oil meal production as the beans of Manchuria. The great soybean oil and oil meal production of the Orient is confined almost entirely to Manchuria.

Another thing which surprised us greatly was the extent to which soybeans are used for green manure purposes in the rice paddies. Not so long ago we were in an extensive rice growing area and as we walked through this section, it looked more like

a large soybean growing area. This idea was soon dispelled by observing the Japanese farmers here and there turning the plants under. In most cases water had been turned in the paddy and the plants were being turned under in mud and water. In a few cases, we observed the plants being turned under in dry paddies.

In addition to the turning under of the soybeans, wheat and barley threshing by

Soybeans are used to a very considerable extent for confectionery purposes. The large black, brown, and green seeded varieties are used in making sweet bean paste which is put up in small thin slabs and then done up in very attractive packages. Roasted beans, similar to our roasted peanuts, may be found at nearly all confectionery stores. Roasted beans are also sugar-coated and others are sprinkled with



Left, Korean woman mashing cooked soybeans in the making of a fermented paste or relish for winter use. Right, different kinds of soy cheese at vendors stand, Peking, China.

rather ancient methods were being carried on. This whole valley section of rice paddies resembled a western wheat area before harvest. The wheat or barley had been planted in the rice paddies in two-foot rows and early in the spring when weather conditions permitted, soybeans were planted in the wheat row middles.

At this time of our visit, June 29 and 30, the beans were nearly all in bloom, but whether in bloom or not, the plants were being turned under and rice plants set out immediately. The varieties used for green manure are for the most part the small flat back or greenish-yellow seeded sorts of the Peking, Cloud, and Lexington types.

Another extensive use of the soybean is for bean curd or tofu, which is manufactured only in a small way, that is, in small shops scattered about the cities and country villages. This curd is used in many ways, being the meat of the poorer classes. It is used, however, quite generally in making bean-curd soup which is sometimes served at breakfast and nearly always at supper. The bean curd is peddled about from house to house by men with two tubs suspended from a bamboo pole over their shoulders. The sound of the little horn of the bean curd man as he announces his coming has become quite a familiar sound to our ears as we go along the streets or hear him pass under our office windows.

Soy sauce is manufactured on a very large scale and is universally used by the Japanese, rich and poor. We have had the pleasure of visiting the large experimental laboratory of an experiment station given wholly to soy sauce and sake experiments. In Hokkaido we visited a soy sauce factory, the buildings of which covered several acres. In one of the curing vat buildings where the mash is allowed to cure for about 18 months, we counted 90 large vats.

small pieces of sea-weed during the roasting, which gives an appearance of mottled beans (rather a familiar sight to our Midwest farmers). Then, there are the candied beans, that is, beans which have been boiled in syrup.

Miso and natto are two forms of bean foods in which the beans are first cooked and then treated with certain bacteria. Miso is used largely in soups which are eaten or rather drunk at breakfast. Both of these foods are quite largely used.

Other products used for food are roasted soybean flour, soybean vermicelli, pickled green beans in the pod, yuba—the film produced by boiling soybean milk, and dried frozen bean curd.

Another surprising thing is the very extensive use of the soybean as a green vegetable bean. As early as May, small bundles of plants with full grown pods were seen on the market. At the present time the market is virtually flooded with bundles of plants with full grown pods, the seed of which is also full grown. The pods are boiled in salt water and the beans eaten from the pods.

During the past two weeks we have visited large sections near Tokyo where soybeans are grown for green vegetable purposes. The beans are grown in rows two feet apart and in 95 percent of the cases there are other crops planted between the bean rows, such as early cabbage, onions, lilies (for the edible bulbs), late varieties of soybeans, late plantings of soybeans, and other early truck crops.

The soybean season is now on in Japan as is the soybean season in America when this letter reaches you. Motion and still pictures are being taken of the most important features of the soybean in Japan and at some future meeting of your Association we hope to have the pleasure of showing you how the soybean is used in the Orient.

Very sincerely,
W. J. Morse.

Some Recent Work on Inoculation

By DR. LEWIS W. ERDMAN

Director of Research and Production, the Nitragin Co., from a paper given before the Soil Science Society of America.

The 1942 soybean variety tests of the Alabama Experiment Station uncovered an interesting situation. Dr. H. R. Albrecht comments: "The seed was not inoculated and soybeans had not been planted on the land previously so far as I know. The stunted, yellowed rows in the center represent such varieties and numbers which are strictly oil type beans. To the left and to the right are located hay-type varieties along with some yellow seeded ones which were well nodulated despite the fact no inoculation had been applied to the seed."

The soil in which these plants were grown contained native soybean bacteria which could fix nitrogen in the adapted soybeans. These same bacteria were incapable of fixing any nitrogen in the unadapted soybean varieties. Other evidence has shown that highly effective strains of soybean bacteria isolated from commercial varieties growing in the Cornbelt states are not generally effective on southern soybean varieties. Strains showing high nitrogen fixation on Laredos grown in the greenhouse have given disappointing results in the field.

In the spring of 1943 nodulated soybeans, both adapted and unadapted to Alabama conditions, were sent to our laboratory by Dr. Albrecht. Isolations were made from Otootan, Patoka, Macoupin, and Dunfield soybean nodules. These newly isolated strains were used in inoculated Otootan, Macoupin, and Dunfield soybeans in cultures in the greenhouse. The same strains were also used in field tests by the Alabama Station.

The greenhouse experiment showed conclusively that the bacteria from Otootan nodules produced much earlier and greater nitrogen fixation on Otootan soybeans than the Patoka, Macoupin, or Dunfield strains. For several weeks during the growing period, the latter three strains (from yellow seeded oil-type beans) showed no increased vegetative growth over the uninoculated controls.

In 1941 extensive field tests were made in Waukesha County, Wis., using 39 soybean strains on Manchu No. 3 soybeans. About one-half of these strains showed significant increase in yields of seed, varying from four to fifteen percent increase over the controls. A number of the strains that failed to increase the yield in this particular field experiment had repeatedly shown high nitrogen-fixing ability in greenhouse tests. This demonstrates the desirability of supplementing greenhouse studies with actual field tests before selections are made for mass production of legume bacteria inoculants.

We can

REPAINT AMERICA *With Soybean Oil*

• Dr. Kessler is president of the Soybean Paint & Varnish Institute in St. Louis. He plans an extensive trial of 100 percent quick drying soybean oil paint next spring.

By Dr. JOHN J. KESSLER

SOMETHING new has happened in the development of soybean oil paints. It is an exciting piece of news. It is something to take into account when we begin to consider making use of the huge volume of soybean oil during peace time.

Soybean oil paints, made with 100 percent soybean oil, and fast drying, have now been developed and demonstrated. This means a lot for the future of soybean oil.

Let me tell the story right from the beginning.

It has long been known that soybean oil has drying properties. It has been called a semi-drying oil, a slow drying oil and a soft drying oil. All of these statements are true if you take an oil like linseed oil as a standard of comparison. How semi is it, how soft is it, how slow is it, what can be done about it? Questions like these cannot be answered by argument but with patience and research.

Twelve years ago the writer made a direct comparison between linseed and soybean oils by starting with white lead paste and reducing it with both linseed oil and soybean oil and applying the two paints on test fences, after proper driers had been added to both to give optimum drying results. When such a paste is reduced with linseed oil the drying time of the mixed paint is from 3 to 8 hours, depending on the temperature and humidity. When the same paste is reduced with soybean oil the drying time is from 8 to 24 hours, also depending on the temperature and humidity. Note that the already slow drying time of the lead paste and soybean oil is greatly retarded by low temperatures. Furthermore, the already slow drying lead and soybean oil dried soft and sticky, and exposure tests do not have the rating which are shown by lead and linseed oil.

We have found new types of lead, however, which greatly improve the drying qualities of soybean oil, and while these paints are still slow drying, they make a mixed paint of long wear and great hiding qualities. The writer reported the excellent performance of this type of 100 per-

cent soybean oil paint in the *Soybean Digest* of November 1943.

Of course it is well known that 30 percent soybean oil paints have been in extended use over a period of years, and they have proven this much, that 30 percent soybean oil along with 70 percent linseed oil makes a serviceable paint vehicle. But the fact remains that this type of paint is essentially a linseed oil paint in which a small part of the linseed oil has been replaced with soybean oil. Calling such paints soybean oil paints does not change the essential facts.

But several years ago we went all the way and developed a 100 percent soybean oil paint and proved its wearing qualities. It was slow drying at first and we only recommended its use in summer weather and in country areas, away from the smoke and grime of the cities. Large quantities of this paint, over 6,000 gallons, were applied before war restrictions. The results have been excellent.

Let me say here that the path of soybean development has been cleared by a great number of soybean pioneers. I have received many letters during the past few years from men who have described themselves as soybean pioneers, and it has been a thrilling experience to read between the

lines and feel the pride which the writers have taken in the different kinds of trail blazing work they have done. There can be no doubt that the soybean development has come through the faith, vision and experience of these men. But in the hall of fame where will be placed the busts of these intrepid pioneers I should like to add that of Mr. Howard Doane who first dared to believe that a 100 percent soybean oil paint might be developed and who had the nerve to give the idea a practical break. Mr. Doane came to the writer five years ago and discussed his project and invited him to give him an opinion as to its practicability. Then the writer turned the idea into a formula, and Mr. Doane put the paint on homes and barns in Illinois, Iowa and Missouri and thus made it tell its own story unchecked by tradition and prejudice, and thus built up a solid army of fact which has been of the greatest help in making further advances.

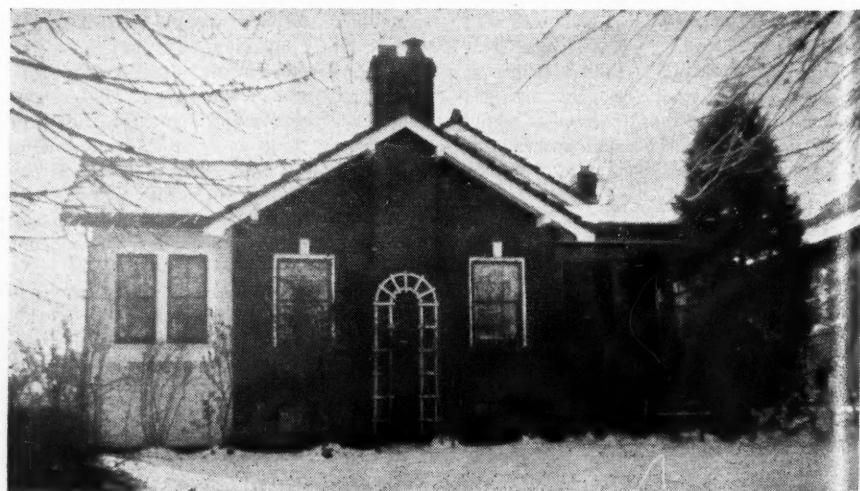
It was out of this experience that the writer organized the Soybean Paint and Varnish Institute, and decided to devote his time to making it a useful agency in promoting the greater use of soybean oil in paints through research and use of publicity.

So it became clear that the best types of outside house paints could be made using 100 percent soybean oil, but with the handicap of slow drying.

That was the situation a year ago. As Jimmy Durante would say, "Them was the conditions what prevailed." We had demonstrated that slow drying, 100 percent soybean paint of the proper formulation could give satisfactory wearing service when used for summer and rural painting. But they were not year round rural paints and they were not urban paints. In other words, they were not fool proof.

That handicap we have now overcome. We now announce the development of fast-drying, 100 percent soybean oil paints of great hiding, easy brushing and long wearing qualities. They have all the qualities of first class paints. Thus we have developed soybean oil into a paint vehicle, not as a substitute for any other oil, but one which stands on its own feet without

Home of Mr. and Mrs. Roy Battenberg, St. Louis, a brick house with trim and stucco addition finished with the 100 percent fast drying soybean oil paint in November, 1944.



needing the reinforcement of 70 percent of something else. The reader should not forget that the question of price and availability enters into this problem.

The home of Mr. and Mrs. James P. Wilson, Moseley Road, Saint Louis County, Mo., is the first home in America, as far as the writer knows, to be painted with fast drying, 100 percent soybean oil paint. The paint began to set up in three hours, as fast as a paint should set up without getting into trouble where the paint is beginning to set up before the painter gets back and tries to overlap what he painted a few hours before.

The home of Mr. and Mrs. Roy Battenberg, 7626 Forest View Drive, Saint Louis, is the first urban home to be painted with fast drying, 100 percent soybean oil paint. This is an interesting exhibit because city painting has to fight the problem of dirt collection from the smoke of coal burning and the grime of oil burning furnaces. Urban conditions are not conditions where soft and slow drying paints show to advantage. But this new type of soybean oil paint is neither soft nor slow drying. It is "just right."

Thus we begin a new chapter in the painting of American homes. A new picture is in the making, a picture in which the paint vehicle is fast drying, 100 percent soybean oil.

So we have the fact that soybean oil paint is past the talking stage, past the laboratory stage, past the test fence stage and is ready to do an increasing service in bringing beauty to our houses, inside and out.

In the postwar period, when labor becomes cheaper, and soybean oil becomes cheaper, we won't like it. But can anybody doubt these hard facts? However, instead of letting this get us down, we can take some of this cheaper labor and this cheaper soybean oil and repaint our homes, starting with the barn and coming through the kitchen, dining room, living room, and not forgetting the fence and the front gate.

Mr. and Mrs. Wilson and family are repainting their home with the soybean oil paint. The dark areas show the condition of the old unpainted surface.



SOYBEANS and HAY

in LIVESTOCK RATIONS

By W. E. CARROLL



● Soybeans make good hay and silage and whole soybeans may be fed to livestock with advantage — if you know how to feed them and to what livestock. Dr. Carroll is head of the Animal Husbandry Department at the University of Illinois. For 14 years he headed the University's swine work.

AFUNDAMENTAL weakness of Cornbelt agriculture from the standpoint of livestock production has been, through the years, a shortage of suitable protein feeds with which to balance the corn crop in the feeding program. Clover and alfalfa hays have made a genuine contribution in this direction for roughage consuming animals, but are insufficient for many types of production and, due to their high fiber content, are entirely inadequate for swine and poultry—the principal consumers of corn.

Then came soybeans. While this crop has not entirely solved the problem, it has made a distinct contribution toward its solution and promises to assume even greater importance than now in the livestock production program as the properties of the crop become fully understood.

I have chosen to indicate as best I can the present status of the utilization of soybean forage and the soybean in livestock rations.

SOYBEANS FOR PASTURE

Alfalfa and the clovers are much superior to soybeans as pasture crops. Soybeans

grow from terminal buds and growth ceases once these buds are eaten off, so that the crop does not continue to produce feed while being grazed as alfalfa and clovers do. The tangled nature of the growth of soybeans is another disadvantage because of the damage to the crop which results from the animals moving through it.

Soybeans have been tested in a number of ways as a silage crop: they have been ensiled alone and mixed with corn or sudan grass or other crops. Experience seems to indicate that their best use for silage is in a mixture. When mixed with corn, sorghums or the grasses, soybeans improve the nutritive value of the silage by increasing its protein content. Dairy cows whose rations are not well fortified with protein have been observed to increase their milk flow as they are changed from corn silage to corn-soybean silage and to decrease their flow as a change in the other direction is made.

Whether a given acreage of soybeans can be used to better advantage as silage than if converted to hay has apparently not been determined. In fact, this may well depend on a number of factors such as the cropping system followed, labor distribution, available silo and mow space, and temporary weather conditions.

SOYBEANS FOR HAY

Soybean hay of good quality is of similar composition and feeding value to alfalfa hay. It contains 15 percent of protein and not to exceed 28 or 29 percent of crude fiber. It has been fed experimentally to and has demonstrated its value for all classes of farm animals.

I call to your attention some of the considerations which must be kept in mind if most advantageous use is to be made of the soybean plant when it is used as a hay crop.

In the first place, good quality soybean hay is less commonly seen and more difficult to make than good quality alfalfa hay. The lateness of the soybean hay season is doubtless an important factor, though differences in maturity of the plant when cut for hay, as well as variety, rate of planting and fertility of the soil may all have their influence. The wide variation in nutritive value of soybean hay is evident from the variable results which have been reported from experiments in this field as well as from the varied experience of practical feeders.

Some confusion exists on the question of the stage of maturity of the soybean plant at which it should be cut for hay. It is safe to say that there is no one best stage, as this will differ with the purpose for which the hay is to be used. Increasing yields of hay are obtained with increasing maturity up until the pods are reasonably well filled but before the leaves begin to turn yellow. The principal change

in composition of the plant during this period is an increase in crude fiber and a decrease in carotene. For example, eight samples of soybean hay cut before bloom showed an average fiber content of just over 21 percent; whereas, 22 samples cut when seed was developing contained over 28 percent of fiber on the average. The percentage of protein does not change greatly with maturity. A change which may be of great importance under certain conditions, however, is the rather rapid reduction in vitamin A potency with increasing maturity of the plant during this period. This would come to be a major consideration in case the hay is to be used as the principal source of vitamin A in any ration, but particularly in the rations of swine and poultry, for the reason that these animals cannot consume large amounts of roughage in any form.

It seems evident, therefore, that soybean hay which is to be used in swine and poultry rations, as a principal source of vitamin A, should be made from beans cut at about the bloom stage. For other classes of farm animals, on the other hand, advantage may well be taken of the somewhat greater yield which may be obtained by permitting the crop to mature until the beans are fairly well formed in the pods. Even this mature hay should be harvested, however, before the lower leaves of the plant begin to turn yellow.

A practice which I believe is much too general with soybean hay is to leave it exposed to the weather for long periods of time, even throughout the winter. The alibi given for this—that animals eat the weathered hay readily—certainly does not justify the treatment. Unless the hay is much more resistant to the weather than clover and alfalfa hay, a large part of the nutrients will have been leached from it long before spring.

SOYBEAN SEED

It is the seed of the soybean plant that offers Cornbelt feeders a source of home-grown protein concentrate. As long as the market demand for soybean oil keeps pace with the increased production of beans, few beans are likely to be fed directly to livestock for the meal is more useful for this purpose than the beans. It is conceivable, however, that for a time after the war the acreage, which has been expanded to meet war needs, will provide more oil than can be used readily by peace-time industries. Such conditions may result in considerable amounts of beans being fed, temporarily, at least. If used with discretion, this is no cause for alarm. Members of this Association are well acquainted with the fact that soybeans *cannot* be fed successfully to poultry, that they *should not* be fed to fattening hogs and that they have only limited use in other swine rations. On the other hand, soybeans have been found useful in the rations of beef cattle, dairy cattle, sheep and horses.

Experiments have been very consistent in showing that poultry cannot utilize soybeans to advantage and practical poultrymen have given up trying to include them in rations for their birds.

The situation with hogs is somewhat different. After becoming acquainted with beans, hogs eat them reasonably well and with fairly good results. They are, however, not nearly as effective in most swine rations as soybean oil meal or other available protein-rich concentrates. The principal hazard of feeding soybeans to hogs, relates to the quality of pork produced.



Ground soybeans may be used to the extent of about one-fourth the concentrate mixture for cows in milk.

The soft pork question as it relates to soybeans has been discussed before this Association on several occasions and I have no intention of doing more than call attention to the fact the hazard is real and is still present.

Protein concentrates are less extensively used in feeding sheep and horses than in feeding other classes of farm animals. Whenever a supplement is needed in sheep and horse rations, however, soybeans may be used. In sheep feeding soybeans have proved to be equal to linseed, cottonseed and soybean meals, and if fed to horses in the spring they appear to hasten shedding and the development of a smooth, sleek coat.

Soybeans have proved to be an excellent protein supplement in rations of all classes of beef cattle: fattening cattle as well as young stock and breeding animals. Discretion in their use is advisable under certain conditions. For short feeds up to 100 days, soybeans may be used as the only protein supplement in amounts required to balance the ration. Long-fed cattle on heavy feed are reported to tire of a ration which contains as much as two pounds of soybeans. Under such conditions it may be well to feed a safe amount of beans and use cottonseed oil meal to provide additional protein which may be needed.

Scours are another thing to be guarded against as cattle on a heavy feed of soybeans appear to be somewhat more subject to this malady than cattle which are fed cottonseed meal.

DAIRY CATTLE

Experiments have demonstrated that a grain mixture supplemented with soybeans is just as satisfactory for growing dairy heifers as one supplemented with linseed meal. The dairyman who grows soybeans therefore, has on his farm the necessary source of protein for his young stock.

Ground soybeans may be used to the extent of about one-fourth the concentrate mixture for cows in milk. The oil in the beans increases the proportion of low-melting-point fats in the butter enough to give it an undesirable softness if beans are fed to greater extent than this. Beans fed in practical amounts do not injure the flavor of the resulting milk or butter.

Soybeans appear to contain some principle which, when fed to lactating cows,

interferes with the normal transfer of carotene and vitamin A of the feed into the butterfat which is produced. The factor responsible for this action has not been identified, but it has been shown to be present in both the oil and the oil meal as well as in the entire beans. This suppressing action, while significant, is not complete, so that in the presence of soybeans fairly satisfactory amounts of carotene and vitamin A reach the butterfat if the ration fed has a high vitamin A potency.

Before closing I should like to suggest that wartime expansion of acreage may have introduced certain problems of utilization which were not a part of the smaller prewar production. Illinois is the only state in which soybean production can be considered to have reached a practical maximum before the war. The acreage in other states to which soybeans are adapted has increased over 100 percent compared with prewar acreage. The problems presented by the utilization of a gradual increase and a small total such as Illinois' production during the years of expansion represented, are small compared with those which will come when a peacetime market has to absorb the wartime production of a relatively new crop. This will be especially true in the case of soybeans, for their oil will find strong competition from all classes of fats and oils whose production has also been greatly expanded to meet wartime needs. Such a situation will require patience and foresightedness during the period of readjustment.

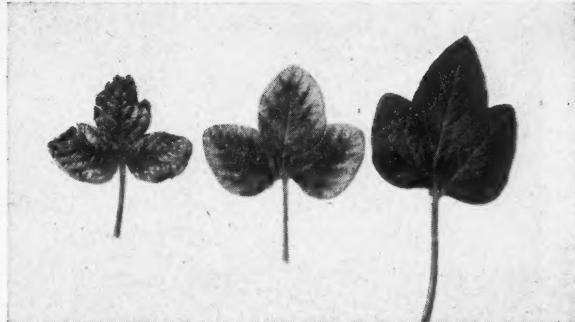
— s b d —

FARM AND HOME AT ILLINOIS

The 44th annual Illinois Farm and Home Week has been scheduled for February 6-8, it is announced by H. P. Rusk, dean of the College of Agriculture at the University of Illinois. As in the past, the three-day program will be held on the Urbana campus of the University.

"An instructive program has been arranged by the committee in charge and will be announced soon," Dean Rusk said.

"Those who find it possible to attend will note that the theme of the overall program will be closely attuned to the times and the needs and demands of the Illinois farm and home."



Left, severe potash deficiency; center, less severe potash deficiency; right, healthy soybean leaf.

FERTILIZING SOYBEANS in North Carolina

By W. E. COLWELL

Agronomy Department, Agricultural Experiment Station, Raleigh, North Carolina. Reprinted from "Better Crops With Plant Foods."

SOYBEANS are grown extensively on the dark, highly organic, imperfectly or poorly drained soils of the Lower Coastal Plain of North Carolina. It is common to fertilize them lightly, if at all, and to rotate with corn which is not heavily fertilized. The yields in many fields of this area are extremely low. It was under these conditions that certain experimental work was carried out in 1943, and, although the information on fertilizing soybeans is far from complete, it has seemed advisable to make available the experimental data which have a bearing on this problem.

Experiments were conducted in Pamlico and Pitt Counties on Portsmouth sandy loam and in Pender County on Dunbar silt loam. Analyses of soils from the three sites are presented in Table I.

The field in Pamlico County had been cropped with corn for two years prior to 1943 and had been fertilized with 250 lbs. of 2-10-6 per acre in 1942 only. The results from the soybean experiment are presented in Table II. The application of 36 lbs. K₂O per acre (side-dressed) resulted in an increase in yield of 8.2 bushels per acre. There was no further increase from the 60-lb. application. The addition of lime (1,000 lbs. dolomite in the row) was without effect. The response from phosphate was not significant. Data not reported show that borax at the rates of 5 lbs. and 10 lbs. per acre was without effect. Similarly, 125 lbs. hydrated copper sulfate per acre broadcast before planting and 25 lbs. per acre in the row did not affect yields.

POTASH DEFICIENCY

The field in Pitt County is reported to have been in corn and soybeans for at least 25 years. In 1942, it was planted to soybeans and no fertilizer was added. In 1941, it was in corn to which 75 to 100 lbs. nitrate of soda per acre were added. The results of the experiment presented in Table 3 show that as applications of potash were increased from 12 to 36 to 60 lbs. K₂O per acre on the uniformly limed plots (3,000 lbs. per acre broadcast), yields were increased progressively, but only to 11.2 bushels per acre. On all these plots, foliar symptoms of potash deficiency were present throughout the summer. It should be noted that without lime the plots receiving 36 lbs. K₂O per acre yielded slightly higher than those receiving the 60-lb. rate with lime. Furthermore, potash-deficiency

symptoms were less pronounced where lime was omitted. It is apparent that on this particular soil the additions of lime did not increase yields, but that high rates of lime accentuated potash deficiency. This is in line with other work, although it was not thought originally that lime had been added at a rate high enough to have this effect. It will be noted that the application of phosphate on this soil did not increase yields.

The third experiment was conducted at the Lower Coastal Plain Branch station on a field which had been planted to corn in 1942 and fertilized with 400 lbs. of 4-8-4 per acre. The general level of fertility was somewhat higher than that at the other two locations. The results of this experiment are presented in Table 4. It will be noted that potash was the only added fertilizer to give an increase in yield. Thirty-six pounds K₂O per acre caused an increase

TABLE 1.—ANALYSES OF SOILS ⁽¹⁾ FROM EXPERIMENTAL FIELDS
Agronomy Department, Agricultural Experiment Station, Raleigh, North Carolina

Location and soil type	pH	Base Exch. Cap.	Ca		Mg		K		P		O.M. %
			M.E./ 100g	M.E./ 100g Lbs/A CaCO ₃ Equivalent	M.E./ 100g	Lbs/A MgO	M.E./ 100g	Lbs/A K ₂ O	M.E./ 100g Lbs/A P ₂ O ₅		
Pamlico County, Surface	5.1	7.44	2.64	2640	.48	195	.08	75	127	2.2	
Portsmouth s. l., Subsoil	4.8	7.83	1.97	1970	.29	115	.06	55	trace	1.3	
Pitt County, Surface	4.9	9.39	2.99	2990	.43	175	.08	75	154	3.4	
Portsmouth s. l., Subsoil	5.1	6.39	2.75	2750	.19	75	.08	75	trace	1.7	
Pender County, Surface	4.6	7.51	1.40	1400	.34	135	.06	55	140	2.6	
L.C.P. Sta. Sunbar s. l., Subsoil	4.2	7.58	1.00	1000	.36	145	.08	75	trace	.4	

(1) Values are averages of four check plots. Analyses made under the supervision of J. R. Piland, Associate Soil Chemist. Exchange capacity by ammonium acetate extraction, phosphorus by .002 N H₂SO₄ extraction, and O. M. by Walkley-Black method.

TABLE 2.—YIELDS AND OIL CONTENTS* OF SOYBEANS (TOKIO) GROWN ON
PORTSMOUTH SANDY LOAM IN PAMLICO COUNTY

Treatment	Yield Bu/A	Oil Content %
(1) Lime—Phosphate—60 lbs. K ₂ O	27.8	18.0
Lime—Phosphate—36 lbs. K ₂ O	27.7	17.9
Lime—Phosphate—	19.5	17.0
—Phosphate—36 lbs. K ₂ O	26.0	18.0
Lime—Phosphate—36 lbs. K ₂ O	24.6	17.9
No fertilizer	20.7	—
Significant difference (.05)	7.3	.71

(1) Lime—1,000 lbs. dolomitic lime in the row.

(2) Phosphate—48 lbs. P₂O₅ per acre from treble superphosphate in the row.

(3) K₂O from 62% muricate of potash side-dressed before the first cultivation.

* Oil determinations made under the supervision of J. R. Piland, Associate Soil Chemist.

TABLE 3.—YIELDS AND OIL CONTENTS OF SOYBEANS (WOODS YELLOW) GROWN ON
PORTSMOUTH SANDY LOAM IN PITTS COUNTY

Treatment	Yield Bu/A	Oil Content %
(1) Lime—Phosphate—60 lbs. K ₂ O	11.2	16.0
Lime—Phosphate—36 lbs. K ₂ O	9.3	15.9
Lime—Phosphate—12 lbs. K ₂ O	6.5	15.1
Lime—Phosphate—	5.4	14.5
—Phosphate—36 lbs. K ₂ O	11.9	15.8
Lime—Phosphate—36 lbs. K ₂ O	9.3	16.2
Significant difference (.05)	3.0	1.1

(1) Lime—3,000 lbs. dolomitic lime per acre broadcast and plowed in just before planting.

(2) Phosphate—48 lbs. P₂O₅ per acre from treble superphosphate in the row.

(3) K₂O from 62% muricate of potash side-dressed before the first cultivation.

of 7.1 bushels per acre and there was no further increase with 60 pounds. Calcium hydroxide was without benefit although there was an early vegetative stimulation. It is interesting to note that the lime added to this soil did not induce potash deficiency as indicated by foliar symptoms or as measured by yields. The calcium level of this soil was relatively low at the outset, 1.4 M. E. per 100 grams soil, as compared to 3.0 M. E. in Pitt County experiment (Table 1).

It is apparent that potash was a major limiting factor in these fields which were selected without previous knowledge of any mineral deficiency. Foliar symptoms of potash deficiency were overcome and yields were increased by potash applications. The occurrence of potash-deficiency symptoms on soybeans in the Coastal Plain is widespread, and this fact, together with the experimental results reported above, support the conclusion that a deficiency of potash constitutes a major problem in soybean production in this area.

TABLE 4.—YIELD OF SOYBEANS (OGDEN) ON DUNBAR SILT LOAM AT THE L. C. P. BRANCH STATION

Treatment		Yield Bu/A	
(1)	(2)	(3)	
Lime—Phosphate—60 lbs. K ₂ O		29.8	
Lime—Phosphate—36 lbs. K ₂ O		32.6	
Lime—Phosphate		25.5	
— Phosphate—36 lbs. K ₂ O		29.3	
Lime— — 36 lbs. K ₂ O		31.2	
Required for significance (.05)		6.9	

(1) Lime—Hydrated lime 2.738 lbs. per acre (equivalent to 3,700 lbs. limestone) broadcast and plowed in just before planting.

(2) Phosphate—24 lbs. P₂O₅ per acre from treble superphosphate in the row.

(3) K₂O from 62% muriate of potash top-dressed before the first cultivation.

Oil analyses in Tables 2 and 3 show that oil content was raised by potash applications. It was not affected by added lime or phosphate. It is not known whether this effect is a direct one, but it is interesting to note that the results are fairly consistent. The problem is being investigated further.

Soybeans are often grown in rotation with cotton and peanuts on upland soils low in organic matter. This practice has been followed experimentally at five locations. Phosphate added to peanuts ahead of soybeans was without effect on yield of soybeans which had themselves received a direct application of 24 lbs. P₂O₅ per acre. Similarly, nitrogen added to the peanuts ahead of soybeans was without effect on yield of the latter which had received a direct application of 4 lbs. nitrogen per acre. At the Upper Coastal Plain Branch Station in 1942, the application of 50 lbs. K₂O per acre to peanuts ahead of soybeans resulted in a 4-bushel-per-acre increase of soybeans which had received a direct application of 12 lbs. K₂O per acre. At the other four locations, potash added to the peanuts was without effect on the yield of beans.

The yields of cotton, which followed the soybeans, were in many cases increased by the potash added to peanuts two years previously. From this it would appear that the level of potash adequate for soybeans is below that which is adequate for

Adequately fertilized soybeans growing in the Coastal Plain area of North Carolina.



cotton. In spite of this, however, the widespread occurrence of potash deficiency on soybeans on these soils indicates that a lack of potash constitutes one of the major

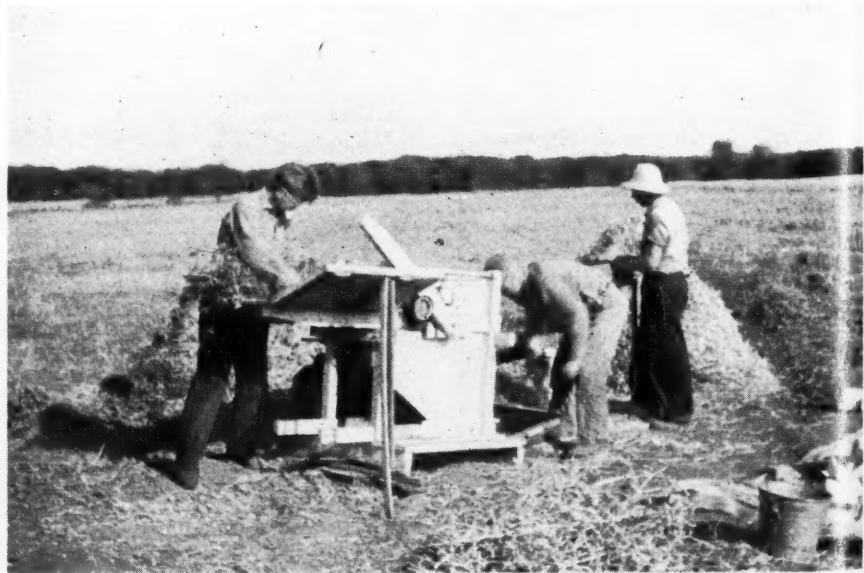
limiting factors in soybean production of these upland soils.

The available information leads to the conclusion that overcoming potash deficiency may be expected to bring about higher yields of soybeans in many fields. At the same time, the existence of other troubles for which no remedy is known at the present time is recognized. Top-dressing applications of 50-100 lbs. muriate of potash prior to the first cultivation are recommended under all conditions. Depending upon previous fertilization, the application of 200 to 300 lbs. 0-10-10, or 0-12-12 (or 3-9-9 if after small grain), is recommended. A broadcast application of around 1,000 lbs. dolomitic limestone is recommended as a practical means of meeting the calcium and magnesium requirements.

Harvesting U. S. D. A. Test Plots

Workers busy threshing out the soybeans on the U. S. D. A. test plots at Strayer Seed Farms, Hudson, Iowa. The beans were threshed out early in November under the direction of R. R. Kalton, of the Bureau of Plant Industry, Ames, who is in charge of the plots. Over 40 different strains are under test here.

Variety test plots have been established at Kanawha, Cherokee, Cresco and Ottumwa, in addition to Hudson and Ames. The one on the Strayer farm has been in existence since 1935.



Some Observations on

THE DEVELOPMENT OF SOYBEANS

in Illinois

By W. L. BURLISON

Head Department of Agronomy, University
of Illinois



BURLISON

SOYBEANS were being studied at the University of Illinois Agricultural Experiment Station before the turn of the 20th century. In April, 1896, Dr. C. G. Hopkins wrote a bulletin entitled "Composition and Digestibility of Corn Ensilage, Cowpea Ensilage, Soja Bean Ensilage and Corn Fodder." This was Bulletin 43 and was the first official publication distributed by the Illinois Agricultural Experiment Station in which soybeans were discussed. In 1897 the University of Illinois issued a circular entitled "The Cowpea and Soybean." Although not much was published on soybeans for almost 20 years, nevertheless, research work continued on both cowpeas and soybeans, with the emphasis gradually shifting to soybeans. Although I am more familiar with the agronomic aspects and shall point most of this discussion to that phase, practically every department of the Agricultural Experiment Station has made important contributions to our knowledge of the growth, management, marketing, and utilization of the crop.

Soybean variety studies have been under way for many, many years. As early as 1903, six varieties were planted in the trial plots. Since that time hundreds of varieties and types have been compared in many parts of Illinois. As improved types and varieties have been developed, the old ones disappeared from the picture. The uses and quality of the crop have increased as a result of the development of

new varieties. In fact, the yield is practically double what it was in the early years of soybean production in Illinois. Dr. C. M. Woodworth of the University of Illinois, selected the Illini as a promising variety as early as 1923. W. J. Morse sent us the Manchu, and Purdue developed the Dunfield. In the search for new strains and varieties, J. L. Carter and his associates located at the United States Regional Soybean Laboratory at Urbana, have contributed greatly, particularly in the analysis of hundreds and hundreds of samples.

In addition to the search for better varieties, early attention was devoted to the improvement of cultural practices. Time of seeding received considerable attention in the early days and again in recent years. The emigration of the corn borer to this part of the country has made it desirable to shift the planting date of corn and to make adjustments in the seeding date of soybeans to prevent too much conflict or competition for the farmer's time and the use of machinery. In general, the shift has been to earlier seeding with May seedings producing higher yields than June seedings as a rule. However, early May seedings have shown no advantage over mid-May or vice-versa.

A cultural practice on which we devoted considerable effort at the University of Illinois was the matter of inoculation. We know now that thorough inoculation of the soybean is imperative if the crop, in

addition to its many other desirable qualities, is to be useful for soil improvement. We have heard arguments concerning the effect of soybeans upon soil fertility. There are many factors which have a bearing upon this subject, but thorough inoculation is one of them. It not only contributes to improved subsequent crop yields, but immediate benefit is obtained in the form of an increased yield of beans. Furthermore, the bean crop itself contains a higher percentage of protein than the uninoculated crop.

USE OF MACHINERY

The mechanics of planting soybeans has never been a very serious problem. The wheat drill and the corn planter have both been used effectively. The University of Illinois agricultural engineers are now working with a farm implement company on the development of a tractor drawn combination seeder and cultivator, a one-man outfit. In this field, as in others, we can expect improvements from year to year as our scientists work on the job.

We at Illinois have been particularly interested in the development of edible soybeans, that is, soybeans particularly adapted for use as human food in the green state. Dr. Sybil Woodruff, a former member of the home economics staff at Illinois, worked with us closely in the early days in the development of the so-called edible soybeans. It was no small task to test out the great number of varieties for flavor, texture, and general appearance, and, in the case of green beans, the shelling time. For example, one of the early tests was conducted with 466 vegetable and field types of soybeans. Seventeen of that group were selected for further study because of having the greatest promise for edible use. Six of the 17 showed special merit. As a matter of record I should like to name those first six. They included: Funk Delicious, Hokkaido, Imperial, Jigun, Willo, and F.P.I. 97155. The agronomic and horticultural characteristics of the better edible varieties were tested by Dr. J. W. Lloyd, former head of vegetable gardening at the University.

THE FUTURE OF THE SOYBEAN

In 1925 the United States produced 4,875,000 bushels of soybeans as compared to the world's production of 179 million bushels or about 2.7 percent of the world's production. Fifteen years later the U. S. production was 87,409,000 bushels as compared to the world's production of 285,000,000 or 30.7 percent of the world's

Cultivating Minnesota Richlands

This field of Richland soybeans on the farm of Mrs. R. C. Matzke, Good Thunder, Minn., went 30 bushels to the acre. Photo was taken when beans were 10 inches high. Mrs. Matzke says her son worked in the processing plant of the Mankato Soya Products Co.



production for 1939. Putting these figures in another way, in 1925 the United States produced approximately one-fortieth of the world's soybeans and in 1939 this nation harvested about one-third of the world's production. This is an increase in this country of about 18-fold, while the world's production shows less than a two-fold increase. The world's increase was very largely accounted for by the increased production from 400,000 bushels in 1925 to about 14 million in 1939, or an increase of 35-fold. For the same period Illinois has increased soybean production from 1,431,000 in 1925 to 45,423,000 in 1939 or an increase of about 32-fold.

Why this rapid increase in soybean production? In 1897 the Illinois Agricultural Experiment Station issued a circular on varieties suited to the soil and climate of that state. From that day investigations on the soybean have been under way. Bulletin 310, issued by the Illinois Station in 1928 gave the following reasons for growing the soybean crop:

1. It is the richest protein-producing grain on the Illinois farm.
2. It is the richest nitrogenous roughage adapted to most farms.
3. It is adapted to many uses and relished by most livestock.
4. If properly handled it furnishes a satisfactory substitute for oats in the cropping system and is a good emergency hay crop.
5. It is adapted to a wide range of soil types.
6. Being a legume, it has merit as a soil builder if used properly.
7. It ranks well as a cash crop.
8. It fits well into Illinois rotations.



—Strotteo Grainews

This is one of the newer Iowa soybean processing plants, that of the Boone Valley Co-op Processing Association at Eagle Grove.

EXPERIMENTS WITH CHICKS

The things which were said in support of the advantages of the soybean have been abundantly borne out on Cornbelt farms, which means that the importance of soybeans to American agriculture is bound to be of greater significance as the years go by.

F E E D I N G

Whole Beans Versus Meal

Hens fed whole soybeans for their supplementary protein lay fewer eggs than those fed soybean oil meal as the protein source. This is indicated by two experiments with laying hens at the New York State Experiment Station, reports G. F. Heuser of that station in Farm Research.

The results of the experiments are given in Table I.

TABLE 1.—PRODUCTION OF SINGLE COMB WHITE LEHIGH HENS

Protein supplement	Number of eggs Experiment I	Experiment II
Animal protein	40.2	93.9
Soybean oil meal	41.2	92.8
Ground raw soybeans	35.7	65.8

The conditions were the same for all birds; however, the rations differed in that the sources of protein were derived from animal protein concentrates including meat scrap, fish meal, casein and dried skim milk, soybean oil meal, and ground raw soybeans. Experiment I lasted 17 weeks and experiment II was carried on for 34 weeks. The results show that there was no difference in the number of eggs pro-

duced between the lots receiving the rations containing animal proteins and the one including soybean oil meal as the protein source. In both experiments the birds that depended on ground raw soybeans for their supplementary protein laid fewer eggs. There was no difference between any of the lots in the deaths or the weights of the birds.

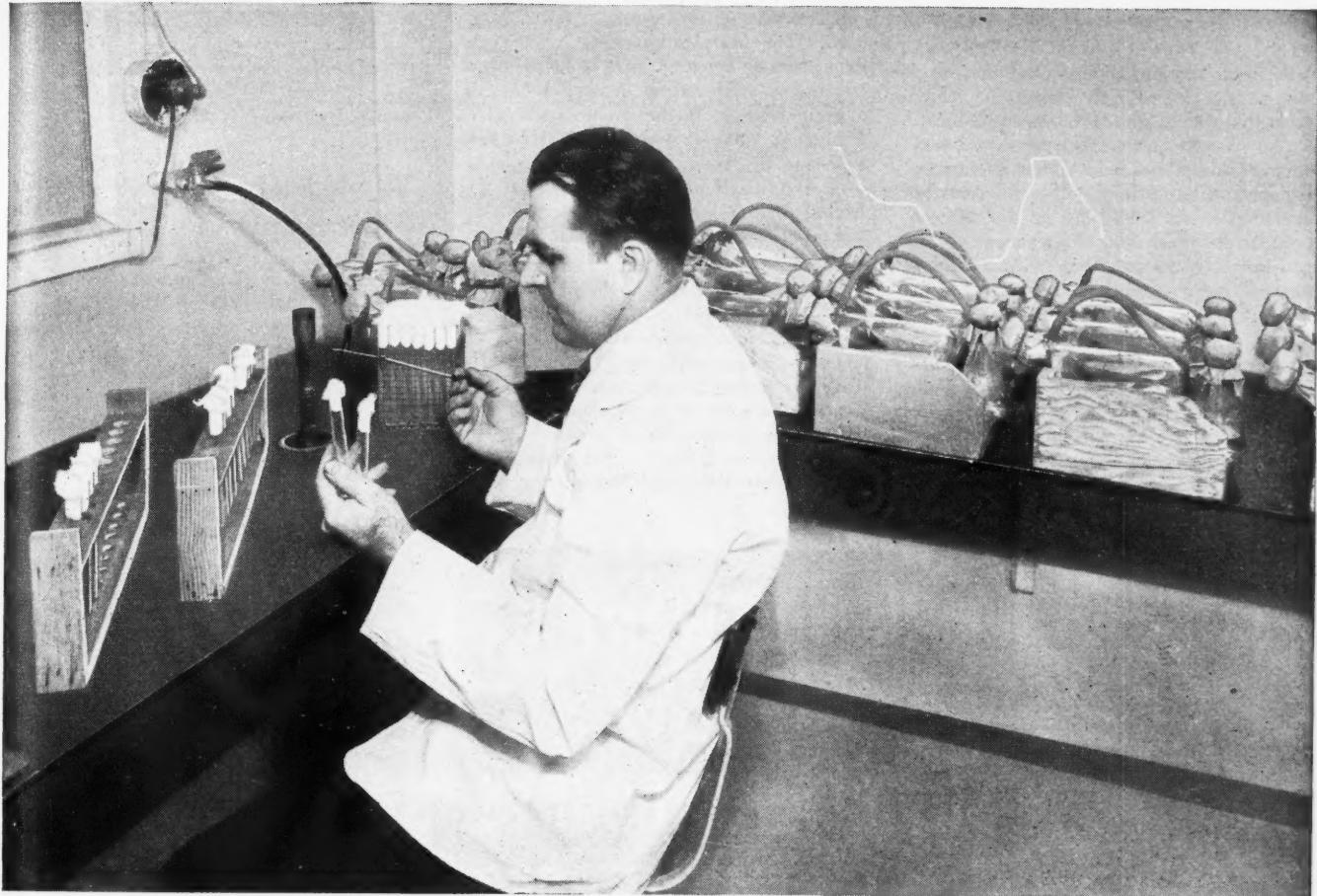
These results are in general agreement with those reported by other workers. The Missouri Agricultural Experiment Station in 1930 reported an average production of 129 eggs for birds receiving a soybean oil meal ration as compared with 102 eggs for those receiving the ground soybean ration. A report from the Delaware Agricultural Experiment Station in 1936 concluded that ground soybeans replacing meat scrap in the laying ration for pullets, in part or all, reduce the egg production. With ground soybeans, the decrease amounted to 13 percent when 6.8 percent was fed and to 32 percent when 16.8 percent was included in the ration. On the other hand, results of trials conducted at the Indiana Agricultural Experiment Station in 1925 indicated that ground whole soybeans were found as satisfactory as soybean oil meal. In this test the hens were allowed free range over a grassy plot at all times.

In an experiment reported from the University of Nebraska in 1942, the average weight of chicks that received a diet containing 23 percent of raw soybeans was 1.03 pounds at 8 weeks of age as compared with 1.51 pounds for the chicks that were fed the ration containing 20 percent of soybean oil meal. This represents for the ground raw soybeans approximately 70 percent of the growth produced by soybean oil meal.

TABLE 2.—RELATIVE PROTEIN EFFICIENCY FOR CHICK GROWTH

Protein supplement	Percentage Efficiency Experiment I	Experiment II
Casein	100	100
Soybean oil meal	92	88
Ground raw soybeans	57	60

Workers at the Delaware Agricultural Experiment Station reported in 1933 that ground soybeans cannot be used to replace all of the animal protein concentrates in a growing ration without affecting the growth, mortality, and feed requirement to produce a unit of gain. They further conclude that if the ground soybeans, supplemented with bone meal, do not replace



Fixo Asks,



DID YOU EVER SEE THE “BIRTH OF A PROFIT”?

Before you dismiss that question as silly, just remember that profits—both for the grower and you—are based on products . . . honest, service-giving products. This illustration shows the beginning of a new lot of pure, strong, virile Nod-O-Gen bacteria for legume inoculation.

Here, our chief bacteriologist, Dr. A. A. Hendrickson, is seen in the laboratory transferring parent strains of the most effective isolations obtainable onto reproduction cultures. These cultures will be still further reproduced until

commercial Nod-O-Gen emerges. All these steps are taken under the most modern scientific conditions . . . conditions just as clean and sterile as those in a first ranking hospital. Every precaution known to the bacteriological world to keep cultures vigorous and uncontaminated is taken.

This unflagging program is carried on to insure better legume crops in the field and to protect your profits by building good will among your customers.

Through Legitimate
Jobbers or Direct

FARM LABORATORY DIVISION
THE ALBERT DICKINSON COMPANY
CHICAGO 90, ILLINOIS
Southern Office and Warehouse: 218 South President Street, Jackson, Mississippi
ESTABLISHED 1854

NOD-O-GEN

The Pre-Tested Inoculator
The Crop and Profit “Pepper Upper”

more than one-third of the meat scrap the results will not be seriously affected.

Soybean protein is improved by heat treatment. It has been known for many years that this is true for soybean oil meal. A number of experiments have shown that different lots of soybean oil meals vary in their efficiency. Much of this difference is due to the variation in the amount of heat used in the processing of the beans. It is generally recognized that meals with a toasted flavor which indicates sufficient heat treatment, are better than meals with a raw or beany taste. More recently this has also been reported for the whole beans. In experiments reported from the University of Nebraska in 1942 just as good growth is shown for chicks at 8 weeks of age receiving 23 percent of soybeans heated for 30 to 60 minutes at 250° F. as for the

chicks receiving 20 percent of soybean oil meal. The Maryland Agricultural Experiment Station reported in 1943 on the heat-treating of soybeans in a small model of a grain drier. The beans heated at 217° F. for 42 minutes were superior to raw soybeans in respect to growth, efficiency of feed utilization, and mortality, but the heated beans were further improved by the addition of 4 percent of fish meal.

It may be concluded, therefore, that ground raw soybeans, as the chief source of supplementary protein in poultry rations, are not as efficient as soybean oil meal or animal protein concentrates. When fed in connection with animal protein, a limited amount of the ground raw soybeans can be fed without seriously affecting the results. Heating the soybeans increases their efficiency. Access to good

grass pasture will help to overcome their deficiencies. As with soybean oil meal, a ration containing ground soybeans is usually improved by the addition of some animal protein.

Whole Beans — Other Results

Results other than those obtained at the Indiana Station showing that feeding ground soybeans to dairy cows does increase the fat content of the milk have been available for some time, points out A. C. Arny, associate agronomist of the University of Minnesota. In South Dakota bulletin 215 entitled "Soybeans for Dairy Cows," published in 1925, the following statement appears: "From the data in Table VIII and IX, it would seem that ground soybeans do increase temporarily the percent of fat in milk with some cows."

O. G. Schafer in Minnesota Bulletin 239 published in 1927 concluded as follows: "Feeding the ground soybean supplement resulted uniformly in raising the percentage of butterfat in the milk. The average butterfat test for the ground soybean group was 4.01 percent as compared to 3.82 percent for the linseed oilmeal group."

A short mention of tentative results at the Indiana station was carried in the November *Soybean Digest*.

— s b d —

ILLINOIS CROP PROFITABLE

The soybean crop has been profitable since the early 1930's and in recent years ranks next to corn in profitability in east central Illinois, according to R. H. Wilcox, associate professor of agricultural economics, University of Illinois. His statement is based on long-time farm cost studies in the area.

"The much expanded soybean crop in 1943 cost \$18.84 an acre on this same group of farms in east central Illinois," says Wilcox. With yields averaging 25½ bushels an acre, the bushel cost was 75 cents. The cost of producing a bushel of soybeans has been gradually increasing during recent years. The evident reasons for this increasing cost per bushel are advancing wages and prices, more beans rowed to control weeds, and gradually declining yields due to more intensive cropping on these Illinois farms.

"An acre of soybeans required 4 man hours, 3 tractor hours, and 1½ truck miles to grow, combine and bin at the farm. On these farms 20 years earlier it required 14 man hours and 31 horse hours an acre of beans. Under those early conditions it cost \$1.50 to produce a bushel of soybeans, twice the 1943 figure."

— s b d —

Harry C. Schaack has been nominated for president of the Chicago Board of Trade in the coming year by the exchange committee designated to select candidates on the regular ticket to be voted on January 8. Mr. Schaack has served as president of the board since July 1, when he was elected to the office after the resignation of P. R. O'Brien.

SOYBEAN DIGEST

IF YOU WANT
Better
SOY BEAN PRODUCTS
.... JUST REMEMBER

- Better proteins are obtained when Ansul Sulfur Dioxide is used in extraction and precipitation.
- Ansul Sulfur Dioxide is a selective solvent for treating soybean oil.
- Bleaching of proteins with Ansul Sulfur Dioxide or hydrosulfites derived from Ansul Sulfur Dioxide improves their color.

ANSUL*
Sulfur Dioxide Liquid by **ANSUL**

*REG. U. S. PAT. OFF.

● Supplied in tank cars, ton drums and 150-lb. cylinders.

ANSUL CHEMICAL COMPANY
MARINETTE, WISCONSIN
EASTERN OFFICE: PAOLI, PENNSYLVANIA
SBH-144

THIRTY YEARS OF KNOWING HOW

ASK US!
The Ansul Technical Staff will gladly help you work out problems of application and handling of Sulfur Dioxide. Ask us—anytime!



GROWERS



Varieties for Iowa

Watch the maturity of soybean varieties in your locality and choose those for next year's planting which when planted in the usual planting season have matured satisfactorily, Ed Dyas, extension agronomist at Iowa State College, advises farmers.

The Iowa Agricultural Experiment Association this year inspected 200 Iowa soybean fields for certification.

Half of the fields inspected were of the Richland variety, Dyas says. Other recommended varieties include Earlyana and early strains of Manchu for northern Iowa. Some acreage of Earlyana was planted in northern Iowa this year, and a limited amount of seed will be available to growers for next year. On soils of medium to low fertility, Earlyana seems to be fairly well adapted; however it lodges much more than Richland on soils of high fertility.

In north central Iowa, Richland is recommended for fertile soil; Mukden and Black Hilum Manchu for less fertile soils. In central Iowa, the recommended varieties, listed in order of maturity, early to late, include Richland, Mukden, Black Hilum Manchu, Dunfield and Illini. In southern Iowa, Mukden, Dunfield, Illini and Chief are advised.

Contour in Iowa

Iowa farmers who farmed on the contour in 1944 got more corn, oats and soybeans to the acre than those who farmed up and down hill. These conclusions were reached by G. M. Brownning and M. B. Russell, of the Soil Conservation Service and the Iowa Agricultural Experiment Station, after comparing yields of crops grown by the two methods side by side in the same field.

In 1944 the yields from contoured and up-and-down hill areas were compared on 49 fields of corn, 11 fields of soybeans and 3 fields of oats. As an average for the 49 fields of corn, contouring outyielded corn planted up and down hill by 6.8 bushels per acre. Soybeans on the contour outyielded soybeans planted in rows up and down hill by 2.3 bushels per acre. The average for three fields of oats was 6.1 bushels per acre in favor of contouring.

The importance of farming on the contour to prevent serious losses of fertile topsoil is being recognized by more and more of the farmers, the agronomists report. In 1942, 9,000 farmers contoured about 400,000 acres. In 1944 some 25,000 farmers contoured about 1 million acres. Although this represents a substantial increase it is only a small part of the 7 million acres of sloping Iowa land planted to corn and soybeans in 1944 which would have benefited from contouring.

The increases in yield by contouring are explained by the soil and moisture that are saved by the contouring practices as well as the effect which it has on the stand.

Soil loss on the contoured areas is about one-half that from the up-and-down hill areas.

— s b d —

FARM AND HOME

War-lined to three days, the forty-fifth annual Farm and Home Week program at Iowa State College, Feb. 13, 14 and 15, will again provide Iowa farm families opportunity to "go to school" to learn about newest farming practices and profit from the experience of other farmers.

Because of wartime limitations of time and travel facilities, this year's Farm and

Home Week has been trimmed to three days, instead of the five-day duration of prewar times.

In 1943 and 1944 the event was conducted by radio only. This year again the radio will carry a Farm and Home Week program to families unable to come to Ames. The radio program is planned this year for Feb. 12 to 16, inclusive. Both home economics and agricultural programs will be included.

Several of the radio programs will originate from the stage in Great Hall, Memorial Union, at Iowa State College, where campus visitors can view them.

At the campus session, departmental meetings on agricultural practices will be held all three days. Wednesday meetings, in addition to agricultural meetings, will include discussions in regard to farm homes.

Commodity Service for the Trade that Really Puts Service First

WHEN we say we put service *first* in our dealings with the trade, we mean just that. For instance:

- We maintain extensive contacts—backed by a comprehensive wire service. Of our eighty-eight offices, sixty are situated in the areas where commodities are either grown or processed. Result: information direct-from-source to *you* in the shortest possible time.
- In addition, we have specialists in each commodity—men who have built their business lifetime around that particular staple—who can give you practical assistance in working out your commodity problems.
- This *active* service is backed by our weekly commodity letters, *plus* special surveys made when a particular commodity situation calls for such a study.
- Why not put these advantages to work for you *now*? You may have a more detailed explanation of how our commodity service can help you through any of our offices.

MERRILL LYNCH, PIERCE, FENNER & BEANE

Brokers in Commodities and Securities

Underwriters and Distributors of Investment Securities

70 PINE STREET

NEW YORK 5, N. Y.

Offices in 87 Cities

**1944 NATIONAL
SOYBEAN CROP**

193 Million Bushels

National production of soybeans in 1944, estimated at 192,863,000 bushels, is only slightly less than the revised estimate of 193,125,000 bushels harvested last year, reports the U. S. Crop Reporting Board. The acreage harvested for beans was about two percent less than last year, but a yield of 18.4 bushels compared with 18.1 bushels in 1943 brought the production to within 262,000 bushels of the 1943 record crop.

Of the 14,519,000 acres planted for all purposes this year, 13,564,000 acres or about 93 percent was grown alone and about seven percent grown with corn or other crops. This is a slightly higher percentage grown alone than in 1943, when 14,575,000 acres or only 92 percent of the 15,854,000 acres planted for all purposes was grown alone.

An unusually wet spring in much of the soybean area resulted in a considerable amount of late planted acreage and a sizeable reduction of acreage in some states. However, because of the unfavorable planting season, many growers could not seed some of their intended early spring planted

State	SOYBEANS (For Beans)							
	Acreage Harvested†			Yield Per Acre			Production	
	Average 1933-42	1943	1944	Average 1933-42	1943	1944	Average 1933-42	1943
New York	*8	20	14	*14.6	15.0	14.0	*116	300
New Jersey	*8	20	13	*15.0	13.0	10.0	*123	260
Pennsylvania	*10	45	34	*16.1	14.0	14.5	*168	630
Ohio	364	1,308	1,321	18.8	18.5	16.5	9,479	25,956
Indiana	542	1,403	1,403	16.8	18.5	17.0	687	23,150
Illinois	1,612	3,436	3,400	19.6	20.5	21.0	32,508	71,400
Michigan	47	103	110	14.0	15.5	14.5	217	1,596
Wisconsin	15	68	49	13.7	15.5	15.0	1,054	735
Minnesota	*52	246	263	*14.5	13.5	16.5	*734	3,321
Iowa	544	1,975	2,129	17.6	19.5	20.0	10,093	38,512
Missouri	147	561	606	10.4	15.5	17.5	1,678	8,696
North Dakota		10	4		11.0	12.0		110
South Dakota		23	12		11.0	14.0		253
Nebraska	*13	82	27	*12.0	11.5	16.0	*173	943
Kansas	34	244	221	8.8	9.5	15.0	383	2,318
Delaware	23	39	34	13.8	9.0	9.5	316	351
Maryland	15	36	35	13.6	9.0	13.0	205	324
Virginia	43	96	63	13.6	11.0	15.0	597	1,056
West Virginia	1	3	2	12.2	13.0	11.0	16	39
North Carolina	155	257	196	11.4	9.0	10.5	1,793	2,313
South Carolina	9	16	12	6.8	6.5	7.0	60	104
Georgia	12	13	13	6.0	6.5	6.0	72	78
Kentucky	24	78	60	11.6	11.0	13.0	297	858
Tennessee	24	73	72	8.2	13.0	14.5	222	949
Alabama	15	44	47	5.9	5.5	5.5	88	242
Mississippi	52	142	92	9.3	12.0	12.5	566	1,704
Arkansas	69	267	233	12.0	9.5	15.5	905	2,536
Louisiana	19	41	29	12.4	11.5	12.0	241	472
Oklahoma	2	10	6	7.0	5.0	8.0	19	50
Texas	*5	25	2	*8.6	7.5	7.0	*44	188
United States	3,848	10,684	10,502	17.1	18.1	18.4	68,771	193,125
								192,863

†Equivalent solid acreage (acreage grown alone, with allowance for acreage grown with other crops).
*Short-time average.

crops, such as oats; consequently soybeans were substituted.

Thus the weather was a factor in reducing the soybean acreage of some producers and of increasing it for others.

Summer drought caused considerable damage to the crop, especially in the southern and eastern states of the soybean area. Rains in August, however, brought relief to a large part of the acreage and final yields were materially above earlier expectations.

Although part of the crop was planted late, and subject to frost damage, the fall season was exceptionally favorable for maturing the crop with frosts holding off from two weeks to a month later than usual. The excellent weather for both maturing and harvesting resulted in a crop of excellent quality with very low moisture content.

In the heavy producing North Central States, yields were above average except in Ohio, where the drought hit the hardest, and in Indiana, where the yield was only slightly below average. Illinois, with almost one-third of the United States acreage for beans, had the highest average state yield (21.0 bushels) per acre. Iowa, Minnesota, and Missouri all reported yields higher than either last year or average.

Almost three-fourths of the total planted acreage of soybeans was harvested for beans this year, compared with only about two-thirds of the 1943 planted acreage. This shift to beans came from both hay and other purposes and was most pronounced in the North Central States, where the season was very favorable for maturing and harvesting the crop and where other hays yielded well.

This year about 19 percent of the crop was utilized for hay with only nine percent for other purposes (which include acreage grazed or plowed under). In 1943 over 21 percent was cut for hay and 11 percent used for other purposes.

One Way to Conserve SOYBEAN PRODUCTS

27 Conveniently
Located Offices
and Factories

BUFFALO
TOLEDO
PHILADELPHIA
CHAGRIN FALLS
GOSHEN, IND.
MILWAUKEE
MINNEAPOLIS
KANSAS CITY
NEW ORLEANS
JACKSONVILLE, FLA.
DALLAS
ST. LOUIS
CHICAGO
NEW YORK
DETROIT
CLEVELAND
ORLANDO, FLA.
PORTLAND, ORE.
DENVER
PITTSBURGH
OKLAHOMA CITY
SALT LAKE CITY
BOISE
MEMPHIS
HUTCHINSON
REIDSVILLE, N. C.
HARLINGEN, TEXAS



Today, when conservation of vital soybean products is a matter of national concern, you owe it to your fellow countrymen to safeguard your shipments in every way possible.

Take no chances with bags of mediocre quality. Chase commends to you its sturdy Chase Test cotton fabric—a heavy-duty, tight-weave material made to take a lot of buffeting around.

Bags of Chase Test are made in all standard sizes—perfectly printed as you wish. Send for samples.

CHASE BAG CO.

GENERAL SALES OFFICES
309 WEST JACKSON BLVD., CHICAGO, ILL.

SERVICE
COAST to COAST

Lund Says, "Expand World Trade"

By PORTER M. HEDGE

WASHINGTON, D. C.—The future of fats and oil production in the United States is tied up more directly with post-war national prosperity than with tariffs or other restrictive measures which would limit imports of foreign oils, in the opinion of Charles E. Lund, chief of the Commerce Department's Fats and Oils unit.

Mr. Lund gave his views in an interview in which he declared for a reduction of trade barriers, an expanding world trade, and increased use of domestic oils for industrial purposes.

The Commerce chief feels that there may be undue concern among producers of soybean and other vegetable oil crops over effects of future imports of high lauric acid oils such as coconut, palm, babassu, etc. He believes the proper emphasis should be upon building up and expanding the national economy to the point where the domestic vegetable oil industry is in a position to stand on its own feet.

The imported lauric acid oils and domestic oils are not entirely competitive industrially because of different properties and characteristics, Lund says. He believes there should be extensive demand for both in the American market after the war.

"For instance, the soap industry has suffered since the war cut imports of Philip-

pine and other lauric acid oils. The lathering properties of these oils are not duplicated in the domestic oils. As a result, the quality of soap we've been using hasn't been as good. High lauric acid oils that afford the right lathering properties for soap-making are produced only in a tropical climate, and must be imported. Because we have been short of the foreign oils, we've had to use considerable quantities of lard. This, in turn, has reduced the supply of edible fats."

Mr. Lund says that higher quality glycerine also can be made from the foreign lauric oils, an important product in both war and peace because of its use in the manufacture of explosives and pharmaceuticals.

"On the other hand," he adds, "soybean oil is a very versatile oil. It can be used in many ways; in fact is normally used in every industry listed by the Bureau of the Census—the only oil with such a wide application. But industry has hardly begun to find full use for soybean oil and other soy products.

"In my concept of postwar trade, we



PROFITABLE PROTEIN FOR YOUR MIXED FEEDS

Swift's Soy Bean Oil Meal is a profitable protein base for your livestock and poultry feed mixes. It also provides other important and nutritious ingredients to help balance your analysis. And it gives palata-

bility a decided lift.

Supplies of Swift's Soy Bean Oil Meal are now available. But the demand is heavy and they may again be limited. You will be wise to place your order today for your full requirements.

Swift & Company

Mills at: Champaign, Illinois Cairo, Illinois

Des Moines, Iowa Fostoria, Ohio Blytheville, Arkansas

should import the lauric oils for specific purposes, just as we import tung oil, used in making paint, for a specific purpose.

"I favor a reduction of trade barriers to promote better world trade and feel that countries which naturally can produce certain products better should not be denied outlets. And we should remember that the Philippines used to be good customers of ours. They probably will be again."

Mr. Lund believes that the level of national income will, to a large extent, set the demand for domestic vegetable oils during the postwar period. He feels that increased consumption resulting from a rise in national income would come more from expanded industrial rather than edible use of vegetable oils, since there are fewer limits on industrial capacity than upon the capacity of the human stomach.

The U. S. Tariff Commission is making a study to determine the effects of possible

tariff adjustments, up or down, on all commodities and products. The report is due Feb. 1. It will have a section on fats and oils, is expected to be a working basis for future tariff policies and trade agreements.

Mr. Lund suggests that vegetable oil producers who fear competition of foreign oils keep an eye on the future competition of animal fats, such as lard.

"We must export lard to avoid competition with the vegetable oils," he explains, "and we are traditionally producers of surplus edible animal fats.

"Concerned about foreign competition in 1934, we placed a tax on whale oil imported from Norway. As a result, Norway sold the whale oil to Germany and England, which had been buying our lard.

"In 1935, partly because of the tariff and as a result of drought, our lard exports which had previously reached 1,060,000 pounds a year dropped to 97,359 pounds,

though they went up again between 1935 and 1940. The whale oil tax wasn't entirely to blame for the 1935 decline, but I cite it to show some of the factors to be considered in competition from edible animal fats."

Mr. Lund thinks it will be some time before either copra or coconut will again be exported from the Philippines. It's expected that much of the coconut oil crushing capacity either has been damaged or destroyed, or will be before the Japs are driven out. First exports from the islands probably will be delayed until the Jap snipers and guerillas are mopped up.

"By a tremendous war-time effort," Mr. Lund says, "the United States fats and oils industry has increased its output to an all-time record. Our pre-war imports have been more than off-set in expanded domestic volume.

"But the importance of copra and coconut oil imports from the Philippines, which in 1941 totalled 715 million pounds oil basis and accounted for more than a third of all foreign fats and oil shipments received in that year, cannot be measured by volume alone.

"Despite its relative insignificance in domestic disappearance figures (only 7 percent of total 1941 consumption) the loss of coconut oil and copra imports into the United States since Pearl Harbor has been the most serious fats and oils problem confronting this country.

"Solution of this difficulty, through liberation of the Philippines, will allow soap manufacturers to resume pre-war quality standards and expand their markets to meet ever-rising consumer demand."

Mr. Lund sees little immediate prospect for lowering trade barriers against Philippine coconut oil imports, pointing out that the islands have had a favored position. They can ship in oil tariff-free and are charged only a 3-cent processing tax, while other countries have to pay a 2-cent tariff duty and a 5-cent processing tax.

When the Philippines gain their independence—set in the Independence Act as 1946—it is figured, Mr. Lund says, then the import rates paid by other countries will apply to Philippine oils.

Mr. Lund is scheduled to discuss the domestic fats and oil outlook Jan. 25 in an address before the National Margarine Institute at the Bismarck Hotel in Chicago.

— s b d —

PECK RESIGNS

Central Soya Co. officials announced that Ralph C. Holder, head of the Biological laboratory, will also head the Nutritional-Educational department of the company, replacing Lyman Peck whose resignation was accepted recently. Mr. Holder is well known in biological and nutritional circles, having been on poultry investigations for the United States Department of Agriculture, Bureau of Chemistry.

Lyman Peck, who recently resigned from the Central Soya Co., is known chiefly for his educational work in the nutritional field, having worked with the Agricultural Experiment stations and other nutritionists on general livestock nutrition. His plans for the immediate future have not been divulged.



[A simplified Annual Report of the American Railroads in their third year at war]

IN 1944, the railroads rendered to the American public the greatest volume of service ever performed by any agency of transportation.

For doing this job, they received about 9½ billion dollars. That's a lot of money—but most of it was earned by hauling tremendous tonnages of freight for less than one cent per ton per mile and carrying passengers for even less than before the first World War.

Out of every dollar the railroads received—

38¢ was paid out in pay rolls.

29¢ was paid for materials and supplies

of all sorts and other operating expenses.

19¢ was paid in taxes—federal, state and local.

7¢ was paid in interest, rents and other charges—a great share of which went to insurance companies, savings banks, endowed institutions.

2¢ was paid in dividends to stockholders.

5¢ was left over in "change" to cover all such things as restoring roadways and equipment after the war, paying off debts, and providing reserves for the improvement of plant and the modernization of service necessary to keep pace with American progress.



ASSOCIATION OF
AMERICAN RAILROADS
ALL UNITED FOR VICTORY

Specify **FULTON** Cotton Bags for shipping soybeans and soybean meal.

FULTON BAG & COTTON MILLS

Atlanta Minneapolis St. Louis Dallas New York Kansas City, Kans. New Orleans

Manufacturers since 1870

As containers for shipping soybean meal they give real satisfaction. In addition Fulton Quality Bags have the advantage of valuable re-use to farmers and farmers' wives. Made of sturdy, even quality cotton cloth, they amount to a worthwhile premium.

PURINA'S SOYBEAN PROCESSING PLANTS

Today all Purina is engaged in a "Food for Victory" Crusade...a Crusade to help the farmers of America produce efficiently the most meat, milk and eggs from the supplies of feed now available. Purina's four soybean processing plants — every man and every machine — are in this Crusade producing to capacity.

are in the "Food for Victory" Crusade

PURINA MILLS

Soybean Processing Plants are Located at
St. Louis, Missouri • Iowa Falls, Iowa
Circleville, Ohio • LaFayette, Indiana

FOOD WILL WIN THE WAR AND WRITE THE PEACE!

Soy YEAST BREAD

FOR A STRICTLY masculine reaction to bread containing soy flour, we submit a remark overheard by a friend.

"My wife made some of this soy bread yesterday. And it's good! Tastes like it's got *butter* in it!"

That's one way of describing the new flavor-richness that a bit of soy flour imparts to your favorite recipes. Some say it adds a "nut-like flavor." But everyone agrees on one point — that it does make foods taste definitely *better!*

The food value it adds is a decided point in its favor, too, of course! Unlike most plant foods, soy flour provides a "complete protein" which experts say is quite similar in value to that in meat, milk and eggs. In fact, it contains far more protein, pound for pound, than any of them. It is also rich in calcium, phosphorus, iron, and important B-vitamins.

Soy flour is used along with regular flour in dozens of appetizing foods. It adds its extra-satisfying goodness to breads, cakes, pies, cookies, waffles, soups, desserts, and many other kinds of food. It's also an excellent meat-stretcher — for besides stretching the volume of meat dishes like hamburgers and meat loaves, it also stretches the flavor — and actually adds more protein than that much extra meat!

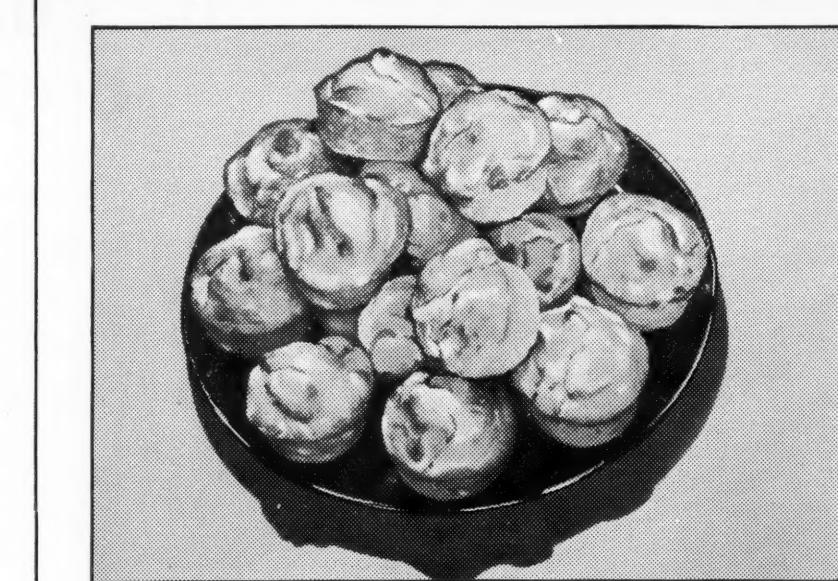
Soy Yeast Bread

(Makes 2 1-pound loaves)

1 cup milk
2 tablespoons sugar
2 teaspoons salt
2 tablespoons shortening
1 cup water
1 cake fresh or granular yeast
1/4 cup lukewarm water
6 tablespoons soy flour
5 1/2 cups enriched white flour (about)

Scald milk. Add sugar, salt, shortening and water. Cool to lukewarm. Add yeast which has been softened in 1/4 cup lukewarm water. Sift soy and enriched white flours separately, measure and sift together. Add gradually, mixing thoroughly until a stiff dough is formed. Turn out on lightly floured board and knead until smooth and satiny. Shape into a smooth ball. Place in greased bowl and grease top of dough lightly.

Cover and let rise in a warm place (80 to 85° F.) until doubled in bulk. Punch down. Let rise again. When again double in bulk divide into two portions. Round up each portion into a smooth ball. Cover and let rest 15 minutes. Mould into loaves. Place in greased standard bread loaf pans and let rise until doubled in bulk. Bake in a moderately hot oven (375° F.) for 20 minutes, then reduce to moderate (350° F.) for 25 minutes more. Brush with



A. E. Staley Mfg. Co.

Soy Blueberry Muffins

(Makes 1 1/2 dozen 2 1/2-inch muffins)

1/2 cup soy flour	1 cup blueberries (raisins or chopped dates)
1 1/2 cups enriched white flour	1 egg
3 teaspoons baking powder	1 cup milk
3/4 teaspoon salt	1/4 cup melted shortening
1/4 cup sugar	
1/2 teaspoon grated lemon rind	

Sift soy flour and enriched white flour separately. Measure and sift together with the baking powder, salt, and sugar. Mix in lemon rind and blueberries. Beat egg, add milk and melted shortening. Stir liquid mixture into dry ingredients, mixing just enough to moisten — do not beat. Fill greased muffin tins two-thirds full and bake in moderate oven (375° F.) for 20 to 25 minutes. If you wish, you may substitute raisins or chopped dates for the blueberries in these muffins.

melted fat, remove from pans and cool on cake rack.

Apple Cobbler

(Serves 6)

4 cups sliced apples
1/2 cup sugar
1/4 teaspoon salt
1/4 teaspoon nutmeg
1/2 teaspoon cinnamon
1/4 cup light molasses
1 tablespoon butter or margarine
1/4 cup soy flour
1 1/4 cups enriched flour
1/2 teaspoon salt
3 teaspoons baking powder
2 tablespoons sugar
1/4 cup shortening
1/4 cup milk

Pare, core, slice and measure apples. Place in a 10x2-inch baking dish. Combine sugar, salt, nutmeg, and cinnamon and sprinkle over apples. Add molasses and dot with butter or margarine. Place in a hot oven (400° F.) for 25 minutes. Meanwhile, sift soy flour and the enriched flour separately. Measure and sift together with the salt, baking powder and sugar. Cut in shortening. Blend in milk to make a soft dough. Spoon dough evenly over partially cooked apples. Return to oven and bake for 20 to 25 minutes. (Serve hot).

This simple dessert requires little time to make as there is no fuss and bother of a rolling pin and board. The drop biscuits are light and tender.

Meat Pie With Soy

(Serves 4-5)

1/4 cup soy flour
1 teaspoon salt
1/4 teaspoon pepper
1 pound beef, cut in small cubes
2 tablespoons fat
Water
4-5 small potatoes, quartered
4 carrots, cut in half lengthwise
4-5 small onions
4 tablespoons soy flour for gravy
4 tablespoons flour
Soy pastry

Season soy flour with salt and pepper. Roll meat in seasoned soy flour taking up as much as possible. Brown well on all sides in hot fat. Cover meat with hot water, cover kettle and cook for about one hour at a simmering temperature. Add vegetables and cook for 40 minutes or until nearly done. Remove meat and vegetables to a casserole. To make the gravy blend 4 tablespoons soy flour with 4 tablespoons white flour with cold water. Stir and cook until slightly thickened and pour over meat and vegetables. Make one-crust pie recipe of soy flour pastry.

Meat Loaf

2 pounds ground meat, any kind available
 1 cup soy flour
 $2\frac{1}{2}$ teaspoons salt
 $\frac{1}{4}$ teaspoon pepper
 $\frac{1}{4}$ cup minced onion
 2 teaspoons prepared mustard
 2 teaspoons Worcestershire sauce
 $\frac{1}{2}$ cup chili sauce
 1 egg, slightly beaten
 $\frac{1}{2}$ cup tomato juice

Combine the ground meat with the other ingredients except the tomato juice. Mix together thoroughly. Shape into a loaf. Place in a greased roasting pan and bake, uncovered, in a moderate oven (350° F.) for about one hour and ten minutes. At the end of the first half hour of baking, baste with $\frac{1}{4}$ cup of tomato juice. Use the other $\frac{1}{4}$ cup for basting the loaf at the end of one hour and bake about ten minutes longer. If desired, baby carrots, small onions and potatoes may be baked around the loaf and your oven meal is all ready to serve. Serve hot or cold. This type of meat loaf slices easily when cold . . . an advantage in making use of any left-over loaf.

Cinnamon Rolls

2 tablespoons table fat
 $\frac{1}{2}$ cup sugar
 2 teaspoons cinnamon

Half of Sweet Roll dough makes 18 to 20 rolls. Roll raised dough one-third inch thick into an oblong 9x18 inches. Spread with softened table fat. Sprinkle with combined sugar and cinnamon. Roll up tightly in a long roll. Cut into one-inch slices. Place close together, cut side down, on a well greased 8x12 inch pan. Cover and let rise until double in bulk. (35 to 40 minutes). Bake in a moderate oven (375° F.) 15 to 20 minutes.

Use of Soy Flour in Logging Camps

By WALTER GOODWIN

Chief, Cupusitic Depot Brown Company, Berlin, N. H., U. S. A.
 Woodlands Section Index No. 737 (B-2)
 September, 1944

The value of soy flour in food products has been recognized by industrial concerns for a number of years. Logging companies have been slower in adopting it, chiefly because propaganda has not been directed to this industry.

Both Mr. Fred Armstrong, commissary advisor for the Brown Company camps, and the writer have discussed the advisability of introducing soy flour to woods cooks. Government agencies have backed the use of this flour, and have supported the soy flour campaign by the use of widespread newspaper and magazine publicity.

We have used soy flour at Cupusitic Depot for a number of months and are more than pleased with the success of our baking, and the way it is appreciated by the men. We feel that it improves not only the "eye appeal" but also the taste, as evidenced by the way the men have taken to this new style of cooking.

We have found that soy flour imparts

an especially fine taste to all yeast raised goods. We are using it in doughnuts, cakes, pie crusts; in fact, for everything. The use of soy flour differs with the products made. For example, four ounces of soy flour are used to every pound of sugar. In sweet dough, we are using six ounces of soy flour to each quart, and the shortening is reduced four ounces as well as the sugar. We have proven that poor doughs will take more soy and produce better results than a rich dough.

Postwar plans naturally recognize the fact that it is necessary to improve camp living conditions, and this, of course, goes for food. Men who appreciate well cooked and wholesome food are going to stay on the job. Thus the best postwar plan that we can submit for tomorrow is to make today's bread and pastry as fine as possible and keep the boys on the job.

The U. S. Department of Agriculture made the following statement concerning soy flour:

In short, there are five general classifications of food and all are vital for substances. They are fats, minerals, vitamins, carbohydrates and proteins. Soy, being high in protein, is vital to the daily diet.

SOYBEAN PROTEINS

Aid to Industry

Outstanding Glidden researches on the production of new Soybean Protein Products and the development of methods for practical use in both old and new industries point the way to still greater achievements.

FIRE FIGHTING

Just one example of an unusual development made possible by the use of "Alpha" Protein, the chemically isolated soybean protein developed exclusively by Glidden.

"Alpha" Protein is the basic raw material used in the manufacture of large quanti-

ties of a new type of foam-liquor for protection of our Navy's fighting men and fighting ships. This liquor gives a heavy blanket of stable foam, clinging to practically any surface, smothering oil and gasoline fires and preventing disastrous flash backs.

THE GLIDDEN COMPANY

Soya Products Division

5165 West Moffat Street

Chicago, Illinois

OBSERVATIONS

By J. E. JOHNSON

Here are accurate reports on 55 of 78 farms managed during past years where soybeans were grown as one of the major crops. I know full well these may seem far below the high yields we hear reported from time to time — the elevator men tell me these high yields are invariably scooped in the bin. To others they may present some of the factors that appear to be of value in maximum soybean production.

The 55 farms total 4,206 acres of soybeans grown during the crop year 1944.

On the whole these are fair to good Cornbelt farms. The average yield for this acreage was 25.5 bu. Three farms were under a 20 bu. average; 18 averaged between 18 and 25 bu.; 33 had an average between 25 and 30; and only one field of 46 acres averaged above 30 — 30.3 bu.

I know how the weather is blamed for poor yields. These farms were scattered over six counties in this territory, to be exact, Champaign and adjoining counties which had favorable and unfavorable weather. Our conclusion: the weather isn't such a retarding factor to the efficient soybean producer.

PRICE OF DRILLING

We had some of the cocksure type who decided on solid drilling because the season was late. What a price this group paid for this decision. The lowest yields were found in this group due to the type of season and in that the seedlings were made heavier to meet the condition they anticipated, which was just the opposite of the actual, and the germination was higher than usual.

Speaking of weather, for this territory we know we have practically the same amount of rain and the same amount of sunshine each year. The variation is negligible.

Then the matter of varieties. With highest regards to the most valuable work done by the plant breeders in producing new varieties of soybeans, as yet the "miracle" soybean must still be in the bag as it hasn't come out as represented by the good salesmen, for instance the McClave, Strange, but true, grain dealers furnished the most fertile field for this humbug.

Of the 55 fields, highest single yield was Chief, size of field 31 acres, yield 39.8 bu. Taking a group of farms totaling 515 acres with 168 acres in soybeans, not a good farm for production of any crop, the average for the 168 acres was 28.3 bu. Variety Chief, method of planting four-row

Why Risk \$10⁰⁰ to Save a Dime?



A good crop of soybeans will grow on good land without proper inoculation—but it grows at an extra cost of at least \$10 per acre in nitrogen taken from the land.

Neither prior crops nor the presence of nodules guarantee the proper inoculation necessary to take this nitrogen "Free From the Air."

Always Use

KALO

INOCULATION

"THE PEER OF THE BEST"

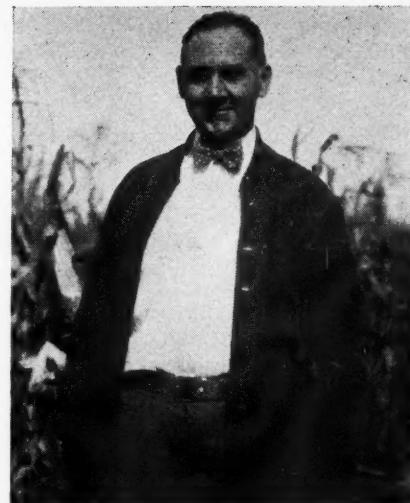
Guarantee proper inoculation at a cost of only pennies per acre

TOP RANKING QUALITY AT NEW LOW PRICES

2 bushel size.....	\$.30
5 bushel size.....	.45
25 bushel size.....	1.95
30 bu. size (6-5 bu. cans)....	2.60

KALO INOCULANT COMPANY

QUINCY, ILLINOIS



SUCCESSFUL SERVICE

When you are equipping your mill or making a change, you will find KELLY DUPLEX ready to help solve your equipment problems . . . help you plan and build the mill machinery you need.

KELLY DUPLEX Machines

are designed to give maximum performance at lowest service cost. We will be glad to send a catalog and offer suggestions whether you are purchasing only one machine or giving consideration to complete mill equipment.

Write FOR CATALOG

60 years' experience backs The Kelly Duplex Line

The Duplex Mill and Mfg. Co.
Springfield, Ohio

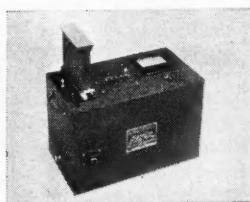
• The editors have asked Joe Johnson, one of Illinois' leading farm managers and past president of the American Soybean Association, and who lives in Champaign County, the world's leading soybean county, to write a column under the above heading for the DIGEST every month. Joe says he is "carrying two men's work" and "certainly do not want to take on more now," yet he does promise a column "when it may have value." We are sure our readers will watch for them.

Get Almost "EVERYTHING" from HEADQUARTERS

... for Grain and Seed House Equipment. Ordering is simplified when you come to "Headquarters". Choose from a broad line moisture testers, germinators, grain handling equipment, trucks, respirators, blowers, etc.

All meet Government standards wherever such are established . . . made of finest materials . . . rigidly inspected.

Write for FREE Catalog No. 144.



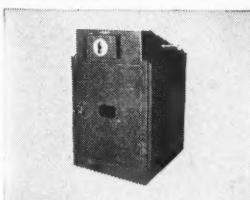
STEINLITE

The Steinlite one minute moisture tester is fast, accurate, easy to use. Economical to operate. It operates on the radio frequency impedance principle. Calibrated against official oven methods. There are more Steinlites in operation than all other makes of electric moisture testers combined.



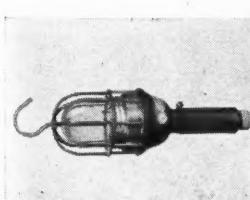
BAG TRUCK

25AR—"Minneapolis" bag truck has 9-inch wrought iron nose with steel strap up the handles, steel plate fastened to nose prevents load from rubbing. Useful in handling bulky sacks and boxes. Bent, hardwood, 48-inch plow handles, 7" diameter rubber tired wheels, roller bearings. Price \$17.50



Mangelsdorf Germinator

Designed to make germination tests using both light and dark methods. It has eight trays size 12½ x 16 inches. The temperature is automatically controlled by a spirit wafer thermostat. Adequately heated by two 16" elements in the base. Dimensions 28" high, 19" deep, 17" wide. Price \$75.00

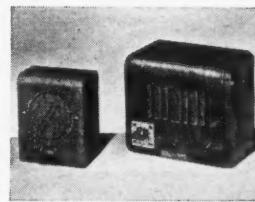


PORTABLE LAMP GUARD

Listed as standard by Underwriter's Laboratories. Every necessary precaution has been taken in the manufacture of this Guard to make it safe for use in the presence of grain dust or inflammable materials. Has 10 outstanding features that make it worth every dollar it costs to you. No. 308 Price \$10.00

CALL-A-PHONE

Inter-office communication system. Saves time, speeds production. You contact one or up to five persons while they remain at their work. Personnel can contact you. Its value has been proven by its long list of satisfied users. Master stations only \$34.00; Sub-stations, each, \$12.50.



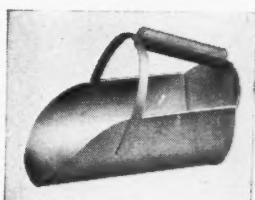
DUPOR RESPIRATOR

The No. 66 Dupor Respirator provides economical low cost protection where dust hazards prevail. Has two large felt filter pads 5/16 inch thick, securing double capacity and a clear entrance aperture of 7½ square inches. Made of soft, high grade rubber and weighs only 4 ounces. Price \$1.65



SCOOP

This handy scoop is made of blue planished steel. The handle, centered instead of at the end, distributes the weight evenly and makes the handling of materials easier and handier. It is available in four different sizes, 8, 10, 12 and 14 inch lengths. See Catalog for prices.



CATALOG NO. 144

The Seedburo Handbook includes the indispensable summary of the official United States Department of Agriculture instructions on grading grain . . . found very useful as a reference book for those concerned with grading grain. Write for your FREE copy of the Seedburo Handbook and Catalog.



Book Your Order NOW . . . Delays Are Dangerous

629 BROOKS BLDG.

CHICAGO 6, ILL.

SEEDBURO
EQUIPMENT COMPANY



corn planter with furrow openers, 36- and 40-inch rows. This farm had plenty of the noxious weeds such as morning glory that are a real hazard, also cocklebur and other common weeds.

The second highest yield was 24.4 acres, variety Richlands. The total soybean acreage on this farm was 86, with an average of 27 bu.; the balance of the field was Chief. Perhaps the outstanding yield was from 200 acres on a 520-acre farm, what we term a problem farm in that the ownership has never limed, phosphated or clov-

ered in the past 10 years — average yield 26.86 bu., variety Illini, seeding method narrow and wide rows to suit the soil fertility.

The rate of seeding in all cases would average about 1 1/4 bu. per acre for the rowed beans. The Richland field was solid drilled and had 1 3/4 bu. of seed per acre; needless to say the field was high in fertility, otherwise this variety would not have been used. Other Richland fields made good showings but in each case were either drilled solid or in narrow rows, largely the

latter, which is much preferred, and the planting date was in keeping with the maturity of this variety. Likewise, the harvesting period was carefully watched so that there was no loss in "popping," a characteristic of any early maturing soybean, also a very few late varieties.

COMBINATION OF FACTORS

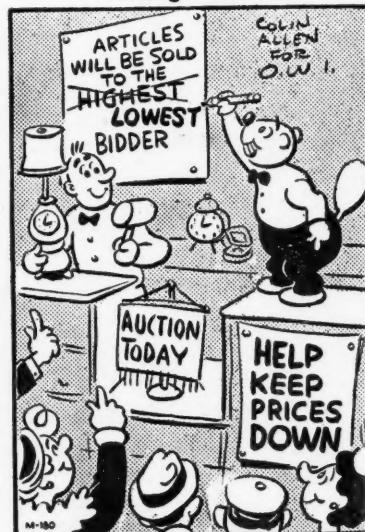
Conclusion: the variety, the weather and the soil are not controlling except on land of extremely low fertility and land subject to erosion. If we have learned anything — and we believe we have — what counts is the combination of all the factors that enter into efficiency of soybean production; fitting the many factors to the farm, yes, even to the field, giving careful attention to the date of planting if using early or full maturing varieties.

If we were to say what is the optimum width row, it is 28 inches. To a farmer buying new machinery I would suggest careful attention be given to the width of row and type of cultivator. You can lose in yield with wider than 28-inch rows; there is little if any to be gained with narrower rows. I do not recommend buying machinery but rather fitting the present machinery to meet the requirements for getting yields.

I do not belong in that group which grows 40 or more bushels per acre and I conclude that the best average yields come from medium soil fertility. Corn should be planted on high fertility soil as it has the ability to make better use of soil material. Also I belong in that group which does not expect to see much of an increase in soybean yields for this territory. If the 10-acre contest has taught us one particular thing, it is the inconsistency of yield from year to year with the same contestant. After all is said and done, the good consistent yield is the answer and *knowing how* to get this is most important. It is the combination of all of the many factors that gets the correct answer, not just one or perhaps two. To be sure a real challenge to any grower.

— s b d —

The Eager Beaver



FOR hammermill grinding, JAY BEE leads! It's the choice of mill operators who must meet heavy schedules. More JAY BEE's are in feed plants than any other type of mill.

JAY BEE stays on the job, day and night if necessary, with little or no stops for repairs. Tough as an Army tank! "It's unbreakable!" says an operator.

Emergency conditions prove the sturdy performance of the JAY BEE. Over a quarter of a century mill making experience, that produces the JAY BEE, now pays big dividends to mill operators.

Whatever your grinding needs, write one of the addresses below for details of JAY BEE Grinding Equipment.

UTICA, NEW YORK J. B. SEDBERRY, INC. FRANKLIN, TENNESSEE
JOHN J. WOODS & SONS, JAY BEE SALES CO., KANSAS CITY, MO.

T. G. Holland Mach. Co., 474 Fairfax Road, Drexel Hill, Pa.
E. B. Harrison, Box 479, Bennettsville, So. Car.
The Lamiell Company, Greenwich, Ohio.
O. D. Padgett, Sandersville, Georgia.
A. F. Shirk, Box 523, Canton, Ohio.
J. E. Sorrells, Slocomb, Alabama.
Snyder Machine Shop, 3d & Emery Street, Longmont, Colorado.
Jay Bee Sales Co., 395 Broadway, New York, N. Y.
Frank S. Sanders, Franklin, Tenn.

Bryant C. Long, 1601 Choctaw Street, Baton Rouge, Louisiana.
Jay Bee Sales Co., Jackson, Tenn.
Jay Bee Sales Co., 4619 So. 7th Ave., Louisville, Kentucky.
Jay Bee of Texas, Dallas, Texas.
W. H. Hust, Jay Bee Co., 1031 N. Humphrey Avenue, Oak Park, Ill.
C. Y. Wier, Sr., Yates Hotel, Utica, N. Y.
W. Harold Grubbs, Box 2469, Winston Salem, North Carolina.
A. E. Thompson Co., 718 Washington Avenue, N., Minneapolis, Minn.

GUILLORY SALES CO. BROKERS

OIL and MEAL
SOYBEAN and COTTONSEED

Cotton Exchange Bldg. Memphis 3, Tenn.
Phones L. D. 451 - 452

REPAIR BAGS *Quickly, Easily*
With
TEHR-GREEZE
FABRIC CEMENT



It really sticks! Ideally suited for patching, mending or repairing clothing, tents, awnings, grain bags, sacks, burlap bags, flour mill silks, canvas, leather goods and many other materials. A thousand uses in home, farm and shop.

EASY TO USE — Just spread a thin coating with a paddle or knife, press pieces firmly together and allow to dry. Will not peel or tear off.

WATERPROOF — Can be washed without loosening the patches. Available in conveniently sized containers. Write for trade prices.

VAL-A COMPANY 700 W. ROOT STREET
CHICAGO 9, ILLINOIS

*Used
BURLAP & COTTON
Bags*

WATERPROOF TARPAULINS



Research...



ST

SOYBEAN DIVISION
ARCHER-DANIELS-MIDLAND COMPANY
ROANOKE BUILDING • MINNEAPOLIS, MINN.



GRITS AND FLAKES

FROM THE INDUSTRY



Clarence F. Baker, recently of Chicago and formerly advertising manager of the Shawnee Milling Co., Okla., has been appointed assistant advertising manager of Pillsbury Mills, Inc., feed mills division, Clinton, Iowa, according to an announcement by Pillsbury officials. Mr. Baker, who will work under the direction of M. E. Cook, advertising manager, has devoted many years to advertising and sales promotion in the agricultural and commercial feed field and his experience will be utilized in the rapidly expanding operations of the Pillsbury feed mills division.

J. G. Reed has been appointed head of Swift & Co.'s vegetable oil buying department succeeding A. C. Stott, who retires after 45 years of service with the company. Reed, who has been with Swift & Co. more than 15 years in various capacities at McKeesport, Pa., Pittsburgh, Denver, Great Falls, Mont., and Chicago, has been Mr. Stott's assistant for the past three

years. He is a graduate of Pennsylvania State University. Mr. Stott is widely known throughout the vegetable oil industry, having been associated with this phase of the Swift's business since 1907.



ILSTRUP

Raymond C. Ilstrup, Minneapolis, has been appointed assistant to Harry R. Schultz, vice-president of the Soy Mills division of Pillsbury Mills, Inc., Clinton, Iowa. With Pillsbury nearly 20 years, Ilstrup has been in the bulk products sales headquarters at Minneapolis for the last three years. He also worked in the traffic and general sales departments at Minneapolis and for several years was bakery products sales manager in the Pillsbury Chicago branch sales office. He is a member of Pillsbury's postwar planning and postwar replacement committees.

**Every Pellet is a Reason Why
California Pellet Mills Produce
Most Pellet Feeds !**

**THE CALIFORNIA
Master MODEL
PELLET MILL ...**

**TWO GREAT MILLS
FOR EVERY
PELLETING NEED**

CALIFORNIA PELLET MILLS

CALIFORNIA PELLET MILL COMPANY
1800 Folsom St., SAN FRANCISCO 3, CALIF.
Board of Trade Building, CHICAGO 4, ILL.

A 283 percent increase in cafeteria meals served to workers in little over a year has resulted from a concentrated study of group feeding problems at the Syracuse, N. Y., plant of the Carrier Corp., reports *Mill & Factory*. Stress has been put on the arrangement of menus, acceleration of service and a program of nutrition education. Among other innovations, soy biscuits are provided and soy flour and grits are used in gravies, soups, pies, etc. Posters are widely used to keep employees nutrition conscious.

An interesting book issued by the Nickel Plate Road is "Along the Line in Indiana," which presents "a composite picture of this territory along the line in Indiana." This is the second of four such projected books, the first being, "Along the Line in Ohio." The book includes a map showing production of soybeans, corn and wheat by counties, and the location of soybean processing plants and grain elevators.

The board of directors of Central Soya, Inc., Fort Wayne, Ind., has elected R. H. Fletcher, president of the company. D. W. McMillen will continue as chairman of the board and will continue as the chief executive of the company. He will devote his entire time to company policies. Mr. Fletcher has been assistant to Mr. McMillen since March of 1943. Prior to coming to Central Soya Co., he was a member of the legal department of the Ohio Oil Co., at Findlay, Ohio.

A large solvent plant to extract oil from soybeans will be constructed in Bellevue, Ohio, in a building project which will cost approximately \$3,000,000, it has been announced by the Spencer-Kellogg Co., and Kellogg & Sons, Inc., Buffalo, N. Y. The project will be built on a 27-acre plot purchased from the Nickel Plate Railroad, with construction scheduled to begin about Dec. 15. Among buildings planned are storage units with space for storage of 2,500,000 bushels of soybeans.

Spencer Kellogg, Jr., former vice president and director of Spencer Kellogg & Sons, Inc., died in Santa Barbara, Cal., Dec. 19. He was 68 years old. He was a large shareholder of the firm founded by his father, but was not active in its management. Surviving are his wife, a daughter, two adopted children, three sisters and his brother, Howard Kellogg, president of the company.

John Cowles, Minneapolis newspaper publisher and editor, has been elected to the board of directors of General Mills, James F. Bell, chairman of the board, has announced. Mr. Cowles becomes the fourteenth member of the General Mills board.

R. T. Milner, head of the analytical and physical chemical division of the Northern Regional Research laboratory, Peoria, Ill., has been appointed to the committee on Analysis of Commercial Fats and Oils by Dr. Klare S. Markley, president of the American Oil Chemists' Society.

Recent appointees to the University of Illinois Agronomy advisory committee are soybeaners W. E. Riegel, Tolono, and W. W. McLaughlin, Decatur, announces H. P. Rusk, dean of the agricultural college.

Powdered pea-soya soup was exhibited by Sardik Food Products Corp., of New York City at the recent meeting of the National Restaurant Association.

— s b d —

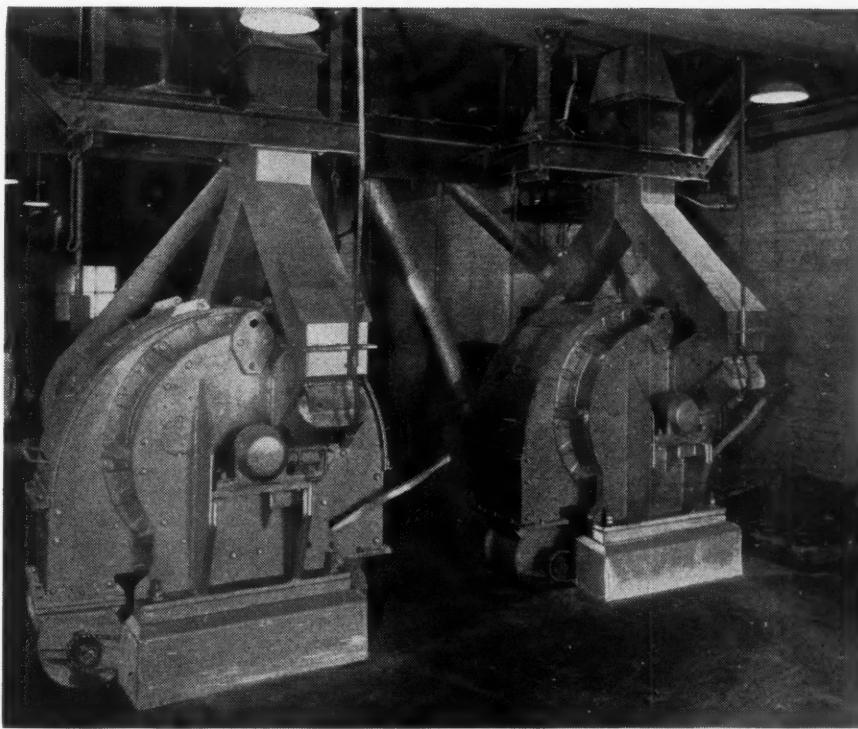
LINCOLN SEED EXHAUSTED

Soybean growers interested in the Lincoln variety for planting next year will likely have to resort to other varieties as the Lincoln seed stocks have been exhausted, reports J. C. Hackleman, professor of crops extension, University of Illinois College of Agriculture, Urbana. Seed growers have been deluged with inquiries for Lincoln seed, but the demand exceeds the supply.

Hackleman pointed to other varieties of soybeans that are adaptable to the three regions of the state: Earlyana and Richland are standard soybean varieties for northern Illinois sections; Illini and Dunfield are adaptable for central sections; while Chief, Patoka and Mt. Carmel are recommended for southern Illinois.

Growers of Lincoln seed in Illinois, Ohio and Indiana have announced prices for 1945, according to Hackleman. The average price suggested by 177 Illinois growers was \$3.54, compared with \$3.50 a bushel for this variety in the other two states.

PRATER Service to the SOYBEAN INDUSTRY



PRATER SERVICE to the Soybean Industry is based on the application of Prater Principles and Products to your problem.

Through Prater Service the quantity, quality of the finished product and time of production is established. Once this cycle is established it will be repeated, unfailingly by Prater Processing Equipment.

Ask about Prater Service on your grinding problems, free from any obligation.

PRATER PULVERIZER COMPANY

1825 South 55th Avenue

Chicago 50, Illinois

**PRATER
PROCESSING EQUIPMENT MILLS
MIXERS**

WASHINGTON Digest

Shakeup in WFA

The recent shakeup of War Food Administration occasioned by J. B. Hutson, president of Commodity Credit Corporation, pulling stakes to become the Administration's No. 1 post-war farm planner, foreshadows no major change in WFA policy, nor little if any in its operations affecting the soybean industry.

Of most immediate interest to produc-

ers is the transfer of all production planning — crop goals work — and feed distribution from the old Office of Production, now liquidated, to the Agricultural Adjustment Agency.

AAA has been responsible for crop production since the beginning of the war, and thus has had a strong hand in goals policy matters. Transfer of goals work to AAA is merely an operational shift to put both the planning for production and the getting of production under one agency instead of two.

Shift of Walter C. Berger's feed distribution branch into AAA has about the same effect. Berger has worked closely with AAA in the past, will continue as head of the feed distribution branch in charge of relations with the industry much the same as before.

Price support work will continue to be under Lt. Col. Ralph Olmstead, former Office of Distribution deputy for supply and price support. Olmstead is slated to become boss of the new Office of Supply, one of two agencies created from the old Office of Distribution.

Frank Hancock, director of Farm Security Administration, becomes also the president of Commodity Credit Corporation. However, day to day operations will be handled by Carl Farrington, a CCC vice-president, who virtually has been running the agency.

Hancock's appointment is looked upon as a move to strengthen Food Administrator Marvin Jones' hand with Congress. Jones has asked for a \$2 billion price support appropriation. Hancock, an ex-Congressman from North Carolina, has many friends on the "Hill."

Hutson's appointment as agricultural deputy to James F. Byrnes, director of war mobilization and reconversion, has the most long-time significance. His job is to work out reconversion and postwar policies and programs for agriculture.

Price control and surplus property disposal as well as agriculture come within the range of Hutson's new responsibilities. Though he has made a clean break with WFA, Hutson's influence is expected to be felt in major policy decisions, since long-time planning cannot completely be divorced from current operations.

Such decisions might involve crop goals for 1946, credit, subsidy operations, method and extent of price supports covering the two-year period after the war.

No February Set-Aside

War Food Administration appears to be pulling out of protein meal distribution which it has partially regulated under a set-aside order for a little more than a year.

For the first time since a year ago last December when the order went into effect, processors next month will be required to make no set-aside of any protein meals, nor will any meal be distributed under the

By PORTER M. HEDGE

Washington Correspondent for
The Soybean Digest

direction of AAA committees or the state feed advisory committees.

WFA decided on this action during the closing days of 1944 after a review of state recommendations had indicated the greatest improvement in protein meal sup-

**CUT
COST
CORNERS**

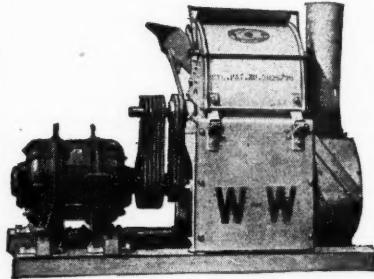
Adequate storage plus fast, efficient handling of soybeans is the one sure way to cut costs and raise profit figures. Hundreds of N & F bins are being installed for that reason. Trained crews erect N & F bins in any size . . . stave or monolithic. Bins are guaranteed. Write for engineering service and catalog.

THE NEFF
& FRY CO.

CAMDEN
OHIO

N & F BINS

**ECONOMY!
CAPACITY!**



How much capacity for how little horsepower is an all-important question to those who are operating grinders on a day-in and day-out basis. You will find that a W-W will give you a maximum service at low cost.

W-W FEATURES ARE FAMOUS

Wide feed openings.

Cool grinding.

Adaptable for any type grinding job.

Staggered hammers prevent clogging or choking.

Reduces moisture loss.

For complete information on W-W Grinders, ask for our Catalog.

W-W. Grinder Corp.

DEPT. SB

WICHITA, KANSAS

SOYBEAN DIGEST

**Say
"SPENCER KELLOGG"**



MINNEAPOLIS



CHICAGO



DES MOINES



DECATUR



LOS ANGELES



BUFFALO



EDgewater



WHEN YOU WANT . . .



Soybean Oil Meal that is made right. *Spencer Kellogg* is not a feed mixer. All the soybean meal made in the *Spencer Kellogg* plants is exclusively for the feed trade. You specialize in making feed rations—we specialize in the meals.

Uniformity and palatability result from the care and experience of skilled processors. The *Spencer Kellogg* process brings you balanced protein for better feeding results.

Say *Spencer Kellogg* for Soybean Oil Meal and Linseed Oil Meal that is made right.

SPENCER KELLOGG AND SONS, INC.

ADMINISTRATION OFFICES—BUFFALO 5, NEW YORK

Sales Offices:

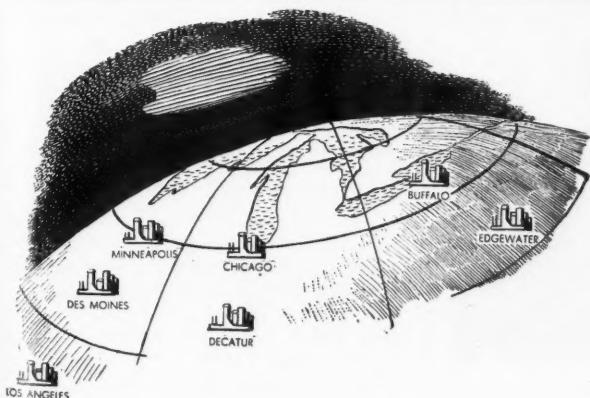
CHICAGO
MINNEAPOLIS

DES MOINES
LOS ANGELES

Processing Plants:

BUFFALO
EDgewater
LOS ANGELES

CHICAGO
MINNEAPOLIS
DES MOINES



pplies in relation to livestock requirements in more than 18 months.

The action is regarded here as more or less of a "trial balloon" to test out meal distribution without government control. If it works — and there's no indication here that it won't — and if meal supplies continue as plentiful in relation to feed requirements as they were figured for January, a comparatively early abandonment of the WFA set-aside order (WFO 9) is expected.

War Food's action for February is contained in a memorandum to the states, and is not a revocation of the set-aside order.

The order, says WFA, "will be continued in order to permit the resumption of the set-aside program in the event of unexpected emergencies."

Informal arrangements have been made with branches of the processing industry "to take care of isolated cases where acute shortages might develop." This has particular reference to the making of range pellets, and WFA asks the trade to continue making as much cake and pellets as possible for winter range feeding.

Processors will continue to be required to make monthly reports of production and shipments by states, and the organization of the state feed advisory committees will be continued.

Here is a brief, official sizeup of the protein meal situation for the month of January on which the new action was largely based:

Linseed meal is very short. Cottonseed meal supplies are a little short of demand. But soybean meal is so plentiful that total oilseed meal supplies for the month are figured to be fully equal to those of January a year ago.

This picture is further brightened by sizeable reductions in livestock numbers—an estimated 30 percent fewer hogs on feed than for January, 1945, about 8 percent fewer laying hens and pullets, and only a little over 1 percent more dairy cows.

WATCH THIS SPACE

In January, February and March for
The Soybean Digest's
Annual
SEED DIRECTORY

Listing names and addresses of seedsmen with soybean varieties and quantities for sale.

Price to subscribers, the three issues

\$2.00

To non-subscribers, including subscription to THE SOYBEAN DIGEST

\$3.00

Send your listing and subscription before February 1 to

**Seed Directory
SOYBEAN DIGEST**
Hudson, Iowa

VEGETABLE SOYBEAN SEED

Choice Seed Stocks

SAC BANSEI AODA

Germination 90% plus

Purity 99.9%

Wholesale Only No Samples

SOYBEAN JOHNSON
Apt. E 1337 McCutcheon Ave.
RICHMOND HEIGHTS 17, MO.

RESEARCH

Effect Of Heat Heat can be either the villain or the hero in the drama of food processing, according to H. H. Mitchell, professor of animal nutrition at the University of Illinois College of Agriculture.

For instance, when soybean oil meal is properly heated, its power to promote animal growth through the nutritive value of its proteins can be improved by 40 percent over that of the raw bean, Mitchell states. Recent laboratory tests showed that soy flour subjected to a temperature of 550 degrees or more for a little over 2 minutes was so changed by the process that its proteins were almost as digestible and as available to the body cells after absorption as were the proteins of beef round. If the soybean is heated too mildly, or if heated too severely the improvement may be much less.

The proteins of cereals, such as wheat and oats, when subjected to the same heating process as the soy flour previously mentioned, instead of being benefited by the process, are definitely impaired in their value as protein foods to the extent of some 23 percent for the growing rat and 13 percent for the adult rat.

— s b d —

Prifogle Wins Indiana Contest

George Prifogle, Franklin County farmer, is winner of the

Indiana soybean yield contest with a production of 47.3 bushels per acre, it is announced. Mr. Prifogle, who is well beyond his seventieth birthday, won in competition with 100 farmers, the largest enrollment in the history of the contest.

Charles Schenk of Vanderburg County was second with 45.3 bushels per acre. Fred C. Price, Clay County, and Walter Askren, Marion County, were tied for third.

C. F. Marshall Goes to OPA

Clive F. Marshall, assistant to the president in the soybean division of

Allied Mills, Inc., of Chicago, is new price executive of the Cereals, Feeds and Agricultural Chemicals branch of OPA's food price division, succeeding Colin S. Gordon, a vice-president of Quaker Oats Co. of Chicago.

Marshall has been with Allied Mills for the last 11 years. He was previously with Albert Dickinson and Co., Chicago; was once with Charlton and Bayshaw of Liverpool, England, in charge of importations of raw materials for mixed feeds.

Market Street

We invite the readers of THE SOYBEAN DIGEST to use "MARKET STREET" for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here.

Rate: 5c per word per issue.
Minimum insertion \$1.00.

SOY-GRASS COOKIES—Wheatless, sugarless, alkaline. The food sensation of the age and LAST WORD IN NUTRITION. 3 packages postpaid for \$1.00. ViVi-Ta Healthful Foods, 480 E. Main, Rochester, N. Y.

WANTED — To hear from owner of farm for sale for spring delivery. Wm. Hawley, Baldwin, Wis.

WE OFFER — Earlyana soybean seed. Certified and a special lot for foundation. Osborn Seed Service, Culver, Indiana.

FOR SALE — Used Steel Storage Tanks, 8,000, 10,000, 12,000, 18,000 gal. And other sizes. Stanhope, Wayne, Penna.

SOYBEAN DIGEST



C. F. MARSHALL

IN THE MARKETS

SOYBEAN INSPECTIONS DROP SHARPLY IN NOVEMBER

Inspections of receipts of soybeans dropped sharply in November to a total of 17,111 cars compared with 32,163 cars in October and with 19,547 cars in November 1943, according to inspectors' reports to the Grain Products Branch of the War Food Administration. November inspections brought the total for the first two months of the season to 49,274 cars compared with 52,819 cars for the same months of 1943.

The quality of soybeans inspected in November continued good, with 85 percent grading No. 2 or better compared with 87 percent in October and with 79 percent in November 1943.

Inspections of soybeans in November included the equivalent of 163 cars inspected as cargo lots, and truck receipts equivalent to about 117 cars.

• **FATS AND OILS OUTPUT.** The 1944-45 output of fats and oils from domestic materials will decrease about a billion pounds from the all-time record of last season, predicts Charles E. Lund, chief, fats and oils unit, U. S. Department of Commerce. This production is expected to reach 10.2 billion pounds, which is nearly a billion pounds more than the 1940-41 pre-war output. With imports expected at about a billion pounds total supplies, including carry-over stocks on October 1, 1944, of 2.3 billion pounds of primary fats and oils, will reach 13.5 billion pounds.

The largest domestic season in the history of this country closed on October 1, 1944. Production of 11.2 billion pounds of fats and oils was nearly 2 billion more than from the last pre-war crop (1940-41). The American farmers and industry have not only offset the loss in imports (one billion pounds) but also have produced sufficient quantities to allow for actual consumption at only a slightly lower rate than in pre-war years, and an increase of a billion pounds in exports.

Total supplies of 13.5 billion pounds during the 1944-45 season will more than meet total requirements, presently estimated at approximately 11.5 billion pounds for both domestic and overseas needs. In order to meet these demands, stocks accumulated during the past season will be drawn on, but at the end of the season they are expected to reach approximately the 2-billion-pound level of the pre-war years 1938-41.

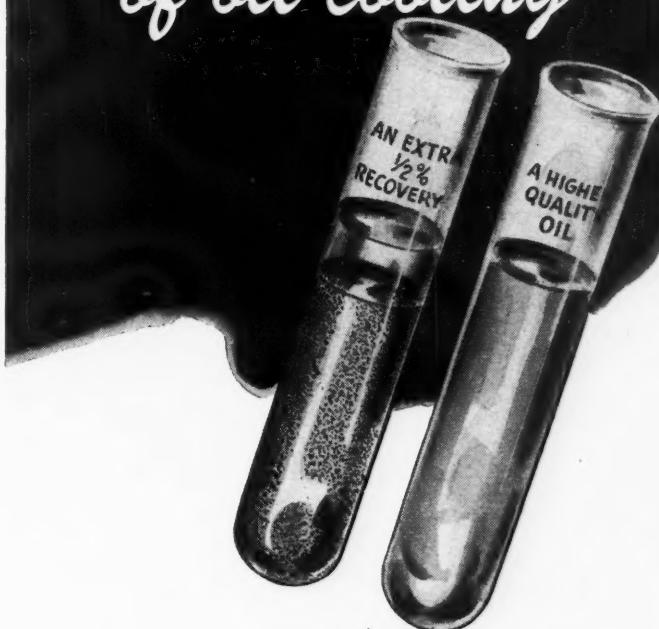
The production of linseed oil is the only one in the vegetable oilseed group which will show a decline compared with the past season. Cottonseed oil production will be up more than a hundred million pounds and soybean oil supplies remain approximately the same.

Lend-Lease needs in the coming year will decrease somewhat from the 1.5 billion pounds allocated in 1943-44, but will still require sizable shipments. Total amounts for reconstruction and relief purposes in Europe are not known at present. It is likely that at least part of the requests will be for shipments of oilseeds, to enable European countries to reestablish their own crushing industry and have the needed oilcake for feed.

• **WORLD SUPPLIES TO INCREASE.** During the next several years, world supplies of fats and oils will be augmented by resumption of exports from the Far East, which in pre-war years averaged about 3½ billion pounds (net) annually, reports the Bureau of Agricultural Economics. Expansion of whaling activities in the Antarctic to the pre-war level would add another billion pounds annually to world supplies. Additional supplies of oilseeds in Argentina will be available when more fuel can be shipped to that area. The 1934-38 average of net exports from surplus-producing areas was approximately as follows:

	Billion Pounds
Manchuria, Chosen, and China (mainly soybeans and soybean oil, tung oil, and peanuts and peanut oil)	1.3
Philippines (chiefly copra and coconut oil)	.8
Dutch East Indies (mainly copra and palm oil)	1.2
Malaya (mainly copra and palm oil)	.2
British and Japanese islands in southwestern Pacific (copra)	.2
Total, Far East	*3.7

TWO TEST TUBES TELL THE STORY of oil cooling



YOUR LABORATORY test tubes tell the story of the advantages of "oil cooling" on Twin-Motor Super Duo Expellers. Analysis of your oil meal will show a ½% greater recovery of oil . . . An analysis of the oil proves its higher quality. Every Twin-Motor Super Duo Expeller can and should be equipped with oil cooling for greater profit.

When considering new pressing equipment be sure to include oil cooling. On request, we will send details on the Twin-Motor Expeller with Oil Cooling.

THE V. D. ANDERSON COMPANY
1935 West 96th Street • Cleveland 2, Ohio

Twin-Motor Super Duo with "All-Purpose" Cooker



